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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT
ZONE K VOLUME V OF V APPENDICES F THROUGH H CNC CHARLESTON SC
6/11/1999
ENSAFE

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY
CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
CTO-029**



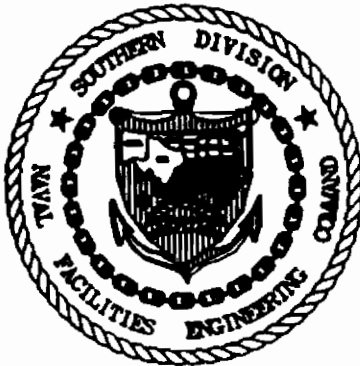
**ZONE K
RCRA FACILITY INVESTIGATION REPORT**

**VOLUME V OF V
APPENDICES F TO H**

**SOUTHDIV CONTRACT
NUMBER: N62467-89-D-0318**

Prepared for:

**DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA**



Prepared by:

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**June 11, 1999
Revision: 0**

Release of this document requires prior notification of the Commanding Officer of the Southern Division, Naval Facilities Engineering Command, North Charleston, South Carolina.

Appendix F
Analytical Data Validation Reports

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0165
CONTRACTED LAB: Ceimic, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994
SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Pesticides/PCB's, Total Metals, Gasoline Range Organics (GRO), Diesel Range Organics (DRO)
SDG NUMBER: 6689 (Level III)

SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Pesticides/ PCB's</u>	<u>Total Metals</u>
166GP00301	6694-14	Water	X		X
166GP00401	6694-15	Water	X		X
166GP00701	6694-12	Water	X		X
166GP01301	6694-11	Water	X		X
166G901401	6694-13	Water	X		X
166GP02201	6694-16	Water	X		X
696SB00101	6694-01	Soil		X	
696SB00102	6694-02	Soil		X	
696SB00201	6689-01	Soil		X	
696SB00202	6689-02	Soil		+	
696SB00202RE	6689-02RE	Soil		X	
696SB00301	6689-03DL	Soil		+	
696SB00301DL	6689-03DL1	Soil		X	
696SB00302	6689-04	Soil		X	
696SB00401	6694-04	Soil		X	
696SB00402	6694-05	Soil		X	
696SB00501	6694-06	Soil		X	
696SB00502	6694-07	Soil		X	

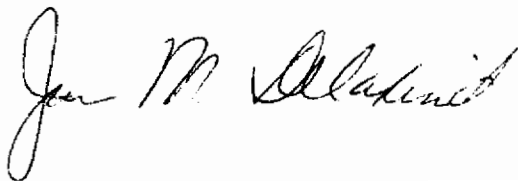
Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Pesticides/ PCB's</u>	<u>Total Metals</u>
696SB00601	6694-08	Soil		X	
696SB00602	6694-09	Soil		X	
166TP02201	6694-17	Water	X		
696TB00101	6694-10	Soil	X		
166GP00401MS	6694-15MS	Water	+		
166GP00401MSD	6694-15MSD	Water	+		
166GP00401D	6694-15DUP	Water			+
166GP00401S	6694-15S	Water			+

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Gasoline Range Organics</u>	<u>Diesel Range Organics</u>
696SB00101	6694-01	Soil	X	X
696SB00102	6694-02	Soil	X	X
696SB00201	6689-01	Soil	X	X
696SB00202	6689-02	Soil	X	X
696SB00301	6689-03	Soil	X	X
696SB00302	6689-04	Soil	X	X
696SB00401	6694-04	Soil	X	X
696SB00402	6694-05	Soil	X	X
696SB00501	6694-06	Soil	X	X
696SB00502	6694-07	Soil	X	X
696SB00601	6694-08	Soil	X	X
696SB00602	6694-09	Soil	X	X

+ = Non-billable analysis

D = MATRIX DUPLICATE, DL = DILUTION, MS / S = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REEXTRACTION / REANALYSIS, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE: 

Data Qualifier Definitions

J	-	The associated numerical value is an estimated quantity.
JB	-	The associated numerical value is an estimated quantity, possibly biased high or false positive based upon blank data or professional judgement.
JH	-	The associated numerical value is an estimated quantity, possibly biased high.
JL	-	The associated numerical value is an estimated quantity, possibly biased low.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 6689 Level III, CLP Organics and Inorganics

SAMPLES: 166GP00301, 166GP00401, 166GP00701, 166GP01301, 166GP01401, 166GP02201, 696SB00101, 696SB00102, 696SB00201, 696SB00202, 696SB00202RE, 696SB00301, 696SB00301DL, 696SB00302, 696SB00401, 696SB00402, 696SB00501, 696SB00502, 696SB00601, 696SB00602, 166TP02201, 696TB00101, 166GP00401MS, 166GP00401MSD, 166GP00401D, 166GP00401S

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for acetone was 26.2% for the standard analyzed on 11/26/96 at 00:52 on instrument HP2, which exceeded the 25% QC limit. The non-detect results for this compound in associated samples 166GP00701 and 166GP01401 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Trip Blanks:

Acetone was detected at 6 ug/kg in soil trip blank 696TB00101. Since there were no soil samples in this SDG fraction, no action was necessary. There were no positive detections in water trip blank 166TP02201. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were field duplicate samples in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

The holding time from sample date to reextraction date was 21 days for sample 696SB00202RE, which exceeded the 14 day QC limit. All results for this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial and Continuing Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was taken.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for the following compounds and associated sample:

<u>Sample</u>	<u>Compound</u>	<u>%D</u>
696SB00301DL	heptachlor epoxide	133
	dieldrin	292
	4,4'-DDT	1290
	endrin aldehyde	255

The associated positive results for compounds with %D's less than 300% were flagged as estimated (J). The positive result for 4,4'-DDT was rejected (R) because the %D exceeded 300%.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

The reextraction analysis of sample 696SB00202 was considered by the validator to be of preferable data quality as compared to the original analysis because of improved Surrogate Recoveries.

The laboratory denoted sample 696SB00301 (1:20 dilution) as the original, Report A analysis. Sample 696SB00301DL (1:2 dilution) was reported as the Report C, dilution sample. The more concentrated sample, "696SB00301DL," was considered by the validator to be more appropriately designated as the primary sample and it was selected for validation. The result for aroclor-1260 was transcribed from sample 696SB00301 to the sample data for 696SB00301DL with appropriate flagging.

The positive result for 4,4'-DDT in sample 696SB00301DL was rejected because of a column %D exceeding 300%. All other laboratory data were acceptable with qualifications.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max Conc.</u>	<u>Action Level</u>
CCB1	aluminum	18.3 ug/L	91.5 ug/L
CCB1	beryllium	0.10 ug/L	0.50 ug/L
CCB1	calcium	17.7 ug/L	88.5 ug/L
CCB1	cobalt	0.60 ug/L	3.00 ug/L
CCB4	copper	1.60 ug/L	8.00 ug/L
CCB1	magnesium	12.6 ug/L	63.0 ug/L
CCB2	selenium	1.90 ug/L	9.50 ug/L
ICB	sodium	6.20 ug/L	31.0 ug/L
PBW	zinc	2.28 ug/L	11.4 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB4	aluminum	-35.1 ug/L	176 ug/L
CCB4	nickel	-0.70 ug/L	3.50 ug/L

CCB = Continuing Calibration Blank

All associated sample results were greater than 5X the absolute value of the negative blank results. No action was required.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	2 ug/L
arsenic	2 ug/L
cadmium	1 ug/L
manganese	7 ug/L
potassium	71 ug/L
selenium	3 ug/L
thallium	10 ug/L
zinc	10 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-5 ug/L
chromium	-8 ug/L
cobalt	-3 ug/L
copper	-8 ug/L
nickel	-10 ug/L
sodium	-233 ug/L
silver	-5 ug/L
vanadium	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) were 16.5% and 18.2%, respectively, for potassium and sodium in dilution sample 166GP00401L, which exceeded the 10% QC limit. All positive results for these two analytes in the SDG samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

All MS Recovery criteria were met. No action was necessary.

The sample concentrations of aluminum and iron exceeded the concentration of the spike added by more than 4X. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) TCL Compound Identification:

All criteria were met, so no action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in the SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) TCL Compound Identification:

All criteria were met, so no action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0166
CONTRACTED LAB: CEIMIC
QA/QC LEVEL: EPA Level IV
EPA METHOD: EPA SOW 3-90
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994*

SAMPLE MATRIX: Soil
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics,
Pesticides/PCB's, Organophosphorus Pesticides,
Chlorinated Herbicides, Gasoline Range Organics, Diesel
Range Organics, Total Metals, Cyanide, Hexavalent
Chromium

SDG NUMBER: 6694 (Appendix IX, Level IV)

SAMPLE:

Client	Lab		Volatile	Semi-	Pesticides/	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Metals</u>
696CB00101	6694-3	Soil	X	X	X	X

Client	Lab		Organophos.	Gasoline Range	Diesel Range
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Pesticides</u>	<u>Organics</u>	<u>Organics</u>
696CB00101	6694-3	Soil	X	X	X

Client	Lab		Chlorinated	Hexavalent	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Chromium</u>	<u>Cyanide</u>
696CB00101	6694-3	Soil	X	X	X

DATA REVIEWER(S): Linda H. Liu, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

CEIMIC - 6694 Appendix IX, CLP Organics and Inorganics

SAMPLE: 696CB00101

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for propionitrile (0.018), acetonitrile (0.026) and 1,4-dioxane (0.016) were below the 0.050 QC limit for initial calibration analyzed on 11/26/96 on instrument HP6. The non-detect results for these compounds in the associated sample were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for propionitrile (0.019), acetonitrile (0.024) and 1,4-dioxane (0.018) were below the 0.050 QC limit for continuing calibration analyzed on 11/26/96 at 21:55 on instrument HP6. Since the non-detect results for these compounds in the associated sample were previously rejected based on low RRF's in the initial calibration, no further action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

TICs:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was taken.

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was required.

VIII.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in sample 696CB00101 due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.027), pentachloronitrobenzene (0.046) and aramite (0.049) for the standards analyzed on 12/10/96 on instrument HP3 were below the 0.050 QC limit. The non-detect results for these compounds in associated sample 696CB00101 were rejected (R).

IV.) Blanks:

There were no positive detections in the method blank, so no action was required.

TIC's:

TIC's were not detected in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

VIII.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for isosafrole, pentachloronitrobenzene and aramite were rejected in the sample in this SDG because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG. No action was taken.

VII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG. No action was necessary.

VII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG, so no action was taken.

VII.) TCL Compound Identification:

All criteria were met, so no action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG, so no action was required.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG, so no action was taken.

VII.) TCL Compound Identification:

All criteria were met, so no action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB1	aluminum	18.3 ug/L	18.3 mg/kg
PBS	barium	0.02 mg/kg	0.10 mg/kg
PBS	beryllium	0.02 mg/kg	0.10 mg/kg
PBS	calcium	4.12 mg/kg	20.6 mg/kg
CCB1	cobalt	0.60 mg/kg	3.00 mg/kg
CCB1	magnesium	12.6 ug/L	12.6 mg/kg
PBS	potassium	15.0 mg/kg	75.0 mg/kg
CCB1	silver	1.00 ug/L	1.00 mg/kg
PBS	sodium	2.06 mg/kg	10.3 mg/kg
PBS	zinc	0.53 mg/kg	2.65 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analyte had a negative result with an absolute value greater than the IDL in the soil preparation blank (PBS):

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
PBS	thallium	-0.694 mg/kg	3.47 mg/kg

The non-detect result for thallium in sample 696CB00101 was flagged as estimated (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

WET CHEMISTRY ANALYSES

HEXAVALENT CHROMIUM

I.) Holding Times:

Holding time from sampling date to analysis date was 8 days for sample 696CB00101 which exceeded the 24-hour QC limit. The non-detect result for this sample was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Hexavalent chromium was not detected in the method blank, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate analysis was not performed in this SDG. No action was necessary.

VI.) Matrix Spike Recovery (MS):

There were no MS / MSD samples in this SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0167
CONTRACTED LAB: CEIMIC
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Total Metals

SDG NUMBER: 6699.1 (Level III)

SAMPLES:

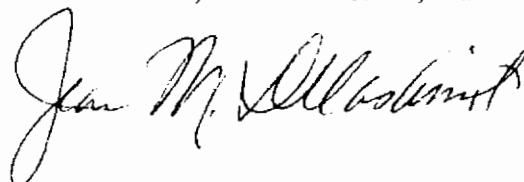
Client Sample #	Lab Sample #	Matrix	Volatile Organics	Total Metals
166GP01601	6699-20	Water	X	X
166GP00101*	6699-21	Water	X	X
166GP02201	6699-23	Water	X	X
166GP01101	6699-24	Water	X	X
166GP01201*	6699-26	Water	X	X
166GP012F1	6699-27	Water		X
166GP03101	6699-28	Water	X	X
166GP01001	6699-29	Water	X	X
166GP01801	6699-30	Water	X	X
166TP01801	6699-34	Water	X	

* = Samples were associated with field duplicate samples 166HP00101 and 166HP01201 in SDG 6699.2.

T = TRIP BLANK

DATA REVIEWER(S): Linda H. Liu, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC - 6699.1 CLP Organics and Inorganics

SAMPLES: 166GP01601, 166GP00101, 166GP02201, 166GP01101, 166GP01201, 166GP012F1,
166GP03101, 166GP01001, 166GP01801, 166TP01801

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC/MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of acetone was 36.1%, which exceeded the 30% QC limit for the initial calibration analyzed on 11/25/96 on instrument HP2. There were no positive results for acetone in the associated samples, so no action was taken.

Continuing Calibration:

The Percent Difference (%D) of acetone was 26.2%, which exceeded the 25% QC limit for the standard analyzed on 11/26/96 at 00:52 on instrument HP2. The results for acetone in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GP00101, 166GP02201, 166GP01101, 166GP01201, 166GP03101, 166GP01001 and 166GP01801.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/26/96 at 14:01 on instrument HP2 for the following compounds:

acetone	40.1%
2-butanone	27.7%

The non-detect results for these compounds in associated sample 166GP01601 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Field Blanks:

Acetone was detected at 5 ug/L in field blank 166FP01101, 7 ug/L in equipment rinsate blank 166EP01801 and 7 ug/L in deionized water blank 166DP01801. These three blanks were analyzed in SDG 6699.2. Since acetone was not detected in the associated samples, no action was taken.

Methylene chloride was detected at 99 ug/L in field blank 166FP01101, which was analyzed in SDG 6699.2. Since methylene chloride was not detected in the associated samples, no action was taken.

Trip Blank:

There were no positive detections in the trip blank. No action was taken.

TICs:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG, no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 166HP00101 and 166HP01201 were analyzed in SDG 6699.2, while corresponding samples 166GP00101 and 166GP01201 were analyzed in this SDG. There were no calculable Relative Percent Differences (RPD's) for these two sets of field duplicate samples, so no action was required.

VIII.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

Incorrect extraction dates were reported on the spreadsheet for all samples. This error was corrected by the validator.

All other laboratory data were acceptable with qualifications.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	aluminum	52.1 ug/L	261 ug/L
ICB	antimony	2.10 ug/L	10.5 ug/L
FB	barium	0.33 ug/L	1.65 ug/L
FB	calcium	28.2 ug/L	141 ug/L
DWB	iron	44.8 ug/L	224 ug/L
CCB1	magnesium	9.10 ug/L	45.5 ug/L
ICB	selenium	2.00 ug/L	10.0 ug/L
FB	sodium	52.6 ug/L	263 ug/L
FB	zinc	10.3 ug/L	51.5 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
DWB = Deionized Water Blank (166DP01801), FB = Field Blank (166FP01801)

The deionized water blank and field blank were analyzed in SDG 6692.2. All results greater than the IDL but less than 5X the blank amount for which the contaminated blank was an associated calibration, deionized water or field blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	calcium	-21.6 ug/L	108 ug/L
CCB3	chromium	-1.80 ug/L	9.00 ug/L
PBW	cobalt	-1.86 ug/L	9.30 ug/L
CCB3	copper	-1.20 ug/L	6.00 ug/L
PBW	nickel	-1.60 ug/L	8.00 ug/L
CCB1	potassium	-33.6 ug/L	168 ug/L
CCB3	silver	-1.70 ug/L	8.50 ug/L
CCB3	tin	-55.0 ug/L	275 ug/L
PBW	vanadium	-0.41 ug/L	2.05 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	4 ug/L
manganese	7 ug/L
potassium	76 ug/L
selenium	3 ug/L
thallium	4 ug/L
zinc	10 ug/L

These analytes should not be present. Aluminum was detected at a concentration comparable to that of ICS Solution A in associated sample 166GP01201. The positive results for these analytes in this sample were flagged as estimated (J).

The following analytes had negative results in ICS Solution A with absolute concentrations greater than the IDL:

barium	-5 ug/L
chromium	-10 ug/L
cobalt	-4 ug/L
copper	-9 ug/L
nickel	-11 ug/L
silver	-6 ug/L
sodium	-234 ug/L

Aluminum was detected at a concentration comparable to that of ICS Solution A in associated sample 166GP01201. The non-detect results for these analytes in this sample were flagged as estimated (UJ).

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) of potassium (31.5%) and sodium (23.0%) exceeded the 10% QC limit in water sample 166GP01601L. Positive results for these analytes in all associated water samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

MS samples were not designated in this SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 166HP00101 and 166HP01201 were analyzed in SDG 6699.2, while corresponding samples 166GP00101 and 166GP01201 were analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

Analyte	<u>166GP00101, ug/L</u>	<u>166HP00101, ug/L</u>	<u>RPD</u>
aluminum	79700	34800	78%
calcium	9990	10600	5.9%
chromium	85.1	31.0	93%
iron	18900	9460	67%
lead	24.2	10.9	76%
manganese	158	97.5	47%
sodium	7270	6310	14%
zinc	96.7	60.2	47%

Analyte	166GP01201, ug/L	166HP01201, ug/L	RPD
aluminum	582000	44100	172%
calcium	11300	8160	32%
chromium	594	49.1	169%
iron	121000	10800	167%
lead	224	20.6	166%
manganese	914	97.9	161%
selenium	12.2	6.1	67%
zinc	2550	291	159%

The Relative Percent Differences (RPD's) for aluminum, chromium, iron, lead, manganese and zinc in the first set exceeded the 30% QC limit for water samples. The positive detections of these analytes in water sample 166GP00101 were flagged as estimated (J).

The Relative Percent Differences (RPD's) for aluminum, calcium, chromium, iron, lead, manganese, selenium and zinc in the second set exceeded the 30% QC limit for water samples. The positive detections of these analytes in water sample 166GP01201 were flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0168
CONTRACTED LAB: CEIMIC
QA/QC LEVEL: EPA Level IV
EPA METHOD: EPA SOW 3-90
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Gasoline Range Organics, Diesel Range Organics, Total Metals, Cyanide, Hexavalent Chromium

SDG NUMBER: 6699.2 (Appendix IX, Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals
161CB00202**	6699-16	Soil	X	X	X	X
166CP01801	6699-35	Water	X			X
166HP00101*	6699-22	Water	X			X
166HP01201*	6699-31	Water	X			X
166DP01801	6699-33	Water	X			X
166EP01801	6699-32	Water	X			X
166FP01101	6699-25	Water	X			X

Client Sample #	Lab Sample #	Matrix	Organophosphorus Pesticides	Gasoline Range Organics	Diesel Range Organics
161CB00202**	6699-16	Soil	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorinated Herbicides	Hexavalent Chromium	Cyanide
161CB00202**	6699-16	Soil	X	X	X

* = Field duplicate samples 166HP00101 and 166HP00201 were associated with samples 166GP00101 and 166GP01201 in SDG 6699.1.

** = Field duplicate sample 161CB00202 was associated with sample 161SB00202 in SDG 6699.

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK

DATA REVIEWER(S): Linda H. Liu, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive, flowing style with a large initial "J".

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC - 6699.2 Appendix IX, CLP Organics and Inorganics

SAMPLES: 161CB00202, 166CP01801, 166HP00101, 166HP01201, 166DP01801, 166EP01801,
166FP01101

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for propionitrile (0.015), acetonitrile (0.020), isobutyl alcohol (0.046), and 1,4-dioxane (0.013) were below the 0.050 QC limit for the water initial calibration analyzed on 11/26/96 on instrument HP6. The non-detect results for these compounds in all associated water samples and field blanks were rejected (R).

The average RRF's for propionitrile (0.018), acetonitrile (0.045) and 1,4-dioxane (0.016) were below the 0.050 QC limit for the soil initial calibration analyzed on 11/26/96 on instrument HP6. The non-detect results for these compounds in the associated soil sample were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for propionitrile (0.014), acetonitrile (0.019) and 1,4-dioxane (0.012) were below the 0.050 QC limit for the water continuing calibration analyzed on 11/27/96 at 11:05 on instrument HP6. Since the non-detect results for these compounds in associated sample 166CP01801 were previously rejected because of low RRF's in the initial calibration, no action was taken.

The Percent Difference (%D) of acrolein was 28.0%, which exceeded the 25% QC limit for the water continuing standard analyzed on 11/27/96 at 11:05 on instrument HP6. The non-detect result for this compound in associated water sample 166CP01801 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Acetone was detected at 4 ug/L in water method blank VBW1125A. Acetone was flagged using the deionized water blank. No further action was taken.

Deionized Water Blank:

Acetone was detected at 7 ug/L in deionized water blank 166DP01801. Detections of acetone in associated samples less than 10X the blank amounts were flagged as undetected (U) with the analytical results below the CRQL being replaced with the CRQL. The associated samples were 161CB00202, 166HP00101, 166HP01201 and 166CP01801.

Equipment Rinsate and Field Blanks:

Acetone was detected at 5 ug/L in field blank 166FP01101 and 7 ug/L in equipment rinsate blank 166EP01801. Blank qualifications for this compound were previously performed using the deionized water blank. No further action was necessary.

Methylene chloride was detected at 99 ug/L in field blank 166FP01101. Since methylene chloride was not detected in the associated samples, no action was taken.

Trip Blank:

There were no positive detections in the trip blank, which was analyzed in SDG 6699.1. No action was taken.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not designated in this SDG. No action was taken.

VII.) Field Duplicates:

Water field duplicate samples 166HP00101 and 166HP01201 were analyzed in this SDG, while corresponding samples 166GP00101 and 166GP01201 were analyzed in SDG 6699.1. There were no calculable Relative Percent Differences (RPD's) for these two sets of field duplicate samples. No action was required.

There were no calculable RPD's for soil field duplicate samples 161CB00202 and 161SB00202 (in SDG 6699). No action was required.

VIII.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The water samples identified on the Chain-of-Custody form as 166HP00101 and 166HP01201 were identified on the spreadsheets as "166CP00101" and "166CP01201." These two sample ID numbers were changed by the validator to the original numbers, which had the correct matrix code "H" for water samples. These changes were not entered in the electronic data file.

The water sample identified as "166CP01801" was assigned a soil matrix code "C." No action was taken since this ID number was used consistently throughout the package, and it was the ID number on the Chain-of-Custody form.

The non-detect results for propionitrile, acetonitrile, 1,4-dioxane and isobutyl alcohol were rejected in all water samples in this SDG because of low RRF's in the initial and continuing calibrations. The non-detect results for propionitrile, acetonitrile and 1,4-dioxane in soil sample 161CB00202 were rejected due to low RRF's in the initial calibration. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.027), pentachloronitrobenzene (0.046) and aramite (0.049) for the standards analyzed on 12/10/96 on instrument HP3 were below the 0.050 QC limit. The non-detect results for these three compounds in associated sample 161CB00202 were rejected (R).

IV.) Blanks:

There were no positive detections in the method blank, no action was required.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples designated for this SDG. No action was necessary.

VII.) Field Duplicates:

There were no calculable RPD's for soil field duplicate samples 161CB00202 and 161SB00202 (analyzed in SDG 6699). No action was required.

VIII.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for isosafrole, pentachloronitrobenzene and aramite were rejected in the sample in this SDG because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples designated in this SDG. No action was necessary.

VII.) Field Duplicates:

There were no calculable RPD's for soil field duplicate samples 161CB00202 and 161SB00202 (analyzed in SDG 6699). No action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, no action was required.

Continuing Calibration:

All Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD's in this SDG, so no action was taken.

VII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG, so no action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG. No action was necessary.

VII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate sample in this fraction of the SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples designated in this SDG, so no action was taken.

VII.) TCL Compound Identification:

All criteria were met, so no action was required.

VIII.) Field Duplicates:

The RPD for field duplicate samples 161CB00202 and 161SB00202 (analyzed in SDG 6699) was not calculable. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this fraction of the SDG, so no action was taken.

VII.) TCL Compound Identification:

All criteria were met, so no action was required.

VIII.) Field Duplicates:

The RPD for soil field duplicate samples 161CB00202 and 161SB00202 (analyzed in SDG 6699) was not calculable. No action was required.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Levels	
FB	aluminum	41.7 ug/L	209 ug/L	41.7 ug/kg
FB	barium	0.33 ug/L	1.65 ug/L	0.33 ug/kg
FB	calcium	28.2 ug/L	141 ug/L	28.2 ug/kg
DWB	iron	44.8 ug/L	224 ug/L	44.8 ug/kg
FB	magnesium	6.10 ug/L	30.5 ug/L	6.10 ug/kg
FB	sodium	52.6 ug/L	263 ug/L	52.6 ug/kg
CCB2	thallium	2.90 ug/L	14.5 ug/L	2.9 ug/kg
FB	zinc	10.3 ug/L	51.5 ug/L	10.3 ug/kg

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (166DP01801),
FB = Field Blank (166FP01101)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples, mg/kg for soil samples) for which the contaminated blank was an associated calibration, deionized water or field blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>	
CCB3	beryllium	-0.10 ug/L	0.50 ug/L	0.1 mg/kg
PBW	calcium	-22.8 ug/L	114 ug/L	22.8 mg/kg
PBW	chromium	-1.61 ug/L	8.05 ug/L	1.61 mg/kg
PBW	cobalt	-1.76 ug/L	8.80 ug/L	1.76 mg/kg
PBW	copper	-1.90 ug/L	9.50 ug/L	1.90 mg/kg
CCB4	mercury	-0.10 ug/L	0.50 ug/L	0.10 mg/kg
PBW	nickel	-1.45 ug/L	7.25 ug/L	1.45 mg/kg
PBW	silver	-1.51 ug/L	7.55 ug/L	1.51 mg/kg
PBS	vanadium	-0.09 mg/kg	0.09 ug/L	0.45 mg/kg

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water),
PBS = Preparation Blank (Soil)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
manganese	9 ug/L
potassium	61 ug/L
thallium	6 ug/L
zinc	4 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-3 ug/L
chromium	-9 ug/L
cobalt	-3 ug/L
copper	-9 ug/L
nickel	-8 ug/L
silver	-5 ug/L
sodium	-232 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) of potassium (25.8%) and sodium (20.1%) exceeded the 10% QC limit in water sample 166HP00101L. Positive results for these analytes in all associated water samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

MS samples were not designated for this SDG. No action was necessary.

IX.) Field Duplicates:

Three sets of field duplicate samples were analyzed. Samples 166GP00101 and 166GP01201 were analyzed in SDG 6699.1. Sample 161SB00202 was analyzed in SDG 6699. Duplicate samples 161CB00202, 166HP00101 and 166HP01201 were analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

Analyte	<u>166GP00101, ug/L</u>	<u>166HP00101, ug/L</u>	<u>RPD</u>
aluminum	79700	34800	78%
calcium	9990	10600	5.9%
chromium	85.1	31.0	93%
iron	18900	9460	67%
lead	24.2	10.9	76%
manganese	158	97.5	47%
sodium	7270	6310	14%
zinc	96.7	60.2	47%

The Relative Percent Differences (RPD's) for aluminum, chromium, iron, lead, manganese and zinc exceeded the 30% QC limit for water samples. The positive detections of these analytes in water samples 166HP00101 were flagged as estimated (J).

Analyte	<u>166GP01201, ug/L</u>	<u>166HP01201, ug/L</u>	<u>RPD</u>
aluminum	582000	44100	172%
calcium	11300	8160	32%
chromium	594	49.1	169%
iron	121000	10800	167%
lead	224	20.6	166%
manganese	914	97.9	161%
selenium	12.2	6.1	67%
zinc	2550	291	159%

The Relative Percent Differences (RPD's) for aluminum, calcium, chromium, iron, lead, manganese, selenium and zinc exceeded the 30% QC limit for water samples. The positive detections of these analytes in water samples 166HP01201 were flagged as estimated (J).

Analyte	161CB00202, mg/kg	161SB00202, mg/kg	RPD
aluminum	3640	4020	10%
calcium	1490	2570	53%
chromium	2.8	3.6	25%
iron	596	735	21%
lead	2	2	0%

All RPD's were within the 60% QC limit for soil samples. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

The water samples identified on the Chain-of-Custody form as 166HP00101 and 166HP01201 were identified on the spreadsheets as "166CP00101" and "166CP01201." These two sample ID numbers were changed by the validator to the original numbers, which had the correct matrix code "H" for water samples. These changes were not entered in the electronic data file.

The water sample identified as "166CP01801" was assigned a soil matrix code "C." No action was taken since this ID number was used consistently throughout the package, and it was the ID number on the Chain-of-Custody form.

WET CHEMISTRY ANALYSES

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding time from sampling date to analysis was 7 days for sample 161CB00202, which exceeded the 24-hour QC limit. The non-detect result for this sample was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Hexavalent chromium was not detected in the method blank, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

There was no MS sample designated in this SDG fraction. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0169
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide, Total Recoverable Petroleum Hydrocarbons - Diesel Range Organics (TRPH-DRO), Total Recoverable Petroleum Hydrocarbons - Gasoline Range Organics (TRPH-GRO)

SDG NUMBER: 6699

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals
161SB00101	6699.17	Soil	+	X	X	X
161SB00101RE	6699.17RE	Soil	X			
161SB00102	6699.18	Soil	X	X	X	X
161SB00201	6699.14	Soil	+	X	X	X
161SB00201RE	6699.14RE	Soil	X			
161SB00202	6699.15	Soil	X	X	X	X
161SB00301	6699.01	Soil	X	X	X	X
161SB00302	6699.02	Soil	X	X	X	X
161SB00401	6699.03	Soil	X	X	X	X
161SB00402	6699.04	Soil	X	X	X	X
161SB00501	6699.05	Soil	X	X	X	X
161SB00501RE	6699.05RE	Soil	+			
161SB00502	6699.06	Soil	X	X	X	X
161SB00601	6699.07	Soil	X	X	X	X
161SB00601RE	6699.07RE	Soil	+			
161SB00602	6699.08	Soil	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals
161SB00701	6699.11	Soil	X	X	X	X
161SB00701RE	6699.11RE	Soil	+			
161SB00702	6699.13	Soil	X	X	X	X
161SB00801	6699.09	Soil	X	X	X	X
161SB00802	6699.10	Soil	X	X	X	X
161TB00102	6699.19	Water	X			
161SB00702MS	6699.13MS	Soil	+	+	+	+
161SB00702MD	6699.13MD	Soil				+
161SB00702MSD	6699.13MSD	Soil	+	+	+	

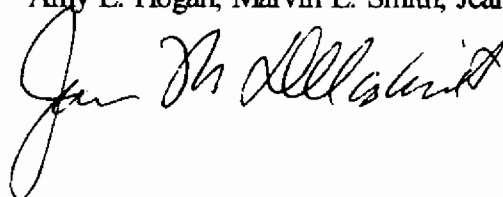
Client Sample #	Lab Sample #	Matrix	Cyanide	TRPH-DRO	TRPH-GRO
161SB00101	6699.17	Soil	X	X	X
161SB00102	6699.18	Soil	X	X	X
161SB00201	6699.14	Soil	X	X	X
161SB00202	6699.15	Soil	X	X	X
161SB00301	6699.01	Soil	X	X	X
161SB00302	6699.02	Soil	X	X	X
161SB00401	6699.03	Soil	X	X	X
161SB00402	6699.04	Soil	X	X	X
161SB00501	6699.05	Soil	X	X	X
161SB00502	6699.06	Soil	X	X	X
161SB00601	6699.07	Soil	X	X	X
161SB00602	6699.08	Soil	X	X	X
161SB00701	6699.11	Soil	X	X	X
161SB00702	6699.13	Soil	X	X	X
161SB00801	6699.09	Soil	X	X	X
161SB00802	6699.10	Soil	X	X	X
161TB00102	6699.19	Water		X	X
161SB00702MS	6699.13MS	Soil	+	+	+
161SB00702MD	6699.13MD	Soil	+		
161SB00702MSD	6699.13MSD	Soil		+	+

+ = Non-billable QC Analysis

MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, T= TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- | | | |
|----|---|---|
| J | - | The association numerical value is an estimated quantity. |
| R | - | The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification. |
| U | - | The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit. |
| UJ | - | The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity. |

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6699 CLP Organics and Inorganics

SAMPLES: 161SB00101, 161SB00101RE, 161SB00102, 161SB00201, 161SB00201RE, 161SB00202, 161SB00301, 161SB00302, 161SB00401, 161SB00402, 161SB00501, 161SB00501RE, 161SB00502, 161SB00601, 161SB00601RE, 161SB00602, 161SB00701, 161SB00701RE, 161SB00702, 161SB00801, 161SB00802, 161TB00102, 161SB00702MS, 161SB00702MD, 161SB00702MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Difference (%D) of 2-chloroethyl vinyl ether was 35.9% for the standard analyzed on 11/21/96 at 09:16 on instrument HP4, which exceeded the 25% QC limit. The results for this compound in associated samples 161SB00402, 161SB00501 and 161SB00502, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) of 2-chloroethyl vinyl ether (37.4%) and vinyl acetate (29.6%) for the standard analyzed on 11/22/96 at 00:35 on instrument HP4 exceeded the 25% QC limit. The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 161SB00401, 161SB00601, 161SB00602, 161SB00701, 161SB00702, 161SB00202 and 161SB00102.

IV.) Blanks:

Method Blanks:

Acetone was detected at 5 ug/L in method blank VB1122B. The positive result for this compound in

associated sample 161SB00302, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result remaining at the CRQL.

Trip Blanks:

There were no positive detections in the trip blanks in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 161SB00202 and 161CB00202 (analyzed in SDG 6699.2). No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of chlorobenzene-d5 and 1,4-dichlorobenzene-d4 were 43.1% and 31.3%, respectively, for sample 161SB00501, which were below the 50-200% QC limits. All results for the compounds quantitated using chlorobenzene-d5, which consisted entirely of non-detects, were flagged as estimated (UJ). There were no compounds quantitated on 1,4-dichlorobenzene-d4 in this sample, so no further action was taken.

The Percent Recovery (%R) of 1,4-dichlorobenzene-d4 was 45.1% for sample 161SB00601, which was below the 50-200% QC limits. There were no compounds quantitated against 1,4-dichlorobenzene-d4 in this sample, so no action was taken.

The Percent Recovery (%R) of 1,4-dichlorobenzene-d4 was 39.7% for sample 161SB00701, which was below the 50-200% QC limits. There were no compounds quantitated using 1,4-dichlorobenzene-d4 in this sample, so no action was taken.

The Percent Recovery (%R) of 1,4-dichlorobenzene-d4 was 49.4% for sample 161SB00101RE, which was below the 50-200% QC limits. No compounds were quantitated on 1,4-dichlorobenzene-d4 in this sample, so no action was taken.

The Percent Recovery (%R) of 1,4-dichlorobenzene-d4 was 37.7% for sample 161SB00201RE, which was below the 50-200% QC limits. No compounds were quantitated on 1,4-dichlorobenzene-d4 in this sample, so no action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 161SB00501, 161SB00601 and 161SB00701 were considered by the validator to be of preferable data quality to the reanalyses based on Internal Standards Percent Recoveries. The reanalyses of samples 161SB00101 and 161SB00201 were considered by the validator to be of preferable data quality to the original analyses because of improved Internal Standards Percent Recoveries and Surrogate Percent Recoveries. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Difference (%D) of pyridine was 25.2% for the standards analyzed on 11/27/96 at 13:30 on instrument HP3, which exceeded the 25% QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 161SB00402, 161SB00602, 161SB00102, 161SB00502, 161SB00401, 161SB00202, 161SB00101, 161SB00802, 161SB00701, 161SB00501, 161SB00801 and 161SB00201.

The Percent Difference (%D) of 2,4-dinitrophenol was 28.9% for the standards analyzed on 11/29/96 at 17:09 on instrument HP3, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample 161SB00301 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for 1,2,4-trichlorobenzene was 33% for spiked samples 161SB00702MS and 161SB00702MSD, which exceeded the 23% QC limit. The non-detect result for this compound in unspiked sample 161SB00702 was flagged as estimated (UJ).

The Percent Recovery (%R) of phenol was 94% for spiked sample 161SB00702MS, which exceeded the 26-90% QC limits. Since the result for this compound in associated unspiked sample 161SB00702 was a non-detect, no action was necessary.

The Percent Recovery (%R) of 2,4-dinitrotoluene was 92% for spiked sample 161SB00702MS, which exceeded the 28-89% QC limits. Since the result for this compound in associated unspiked sample 161SB00702 was a non-detect, no action was necessary.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 161SB00202 and 161CB00202 (analyzed in SDG 6699.2). No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample LCS):

All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 161SB00202 and 161CB00202 (analyzed in SDG 6699.2). No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	aluminum	70.7 ug/L	353 ug/L
PBW	calcium	6.60 ug/L	33.0 ug/L
PBW	zinc	3.54 ug/L	17.7 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>Action Limit</u>
CCB1	beryllium	-0.10 ug/L	0.50 ug/L
CCB1	chromium	-1.00 ug/L	5.00 ug/L
CCB4	cobalt	-0.90 ug/L	4.50 ug/L
CCB1	copper	-1.50 ug/L	7.50 ug/L
CCB4	nickel	-0.90 ug/L	4.50 ug/L
CCB3	potassium	-73.7 ug/L	360 ug/L
PBW	selenium	-0.43 ug/L	2.15 ug/L
ICB	silver	-1.10 ug/L	5.50 ug/L
CCB4	sodium	-9.10 ug/L	45.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBW = Preparation BLank (Water)

All associated positive results less than 5X the absolute value of the negative blank result and all non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	2 ug/L
cadmium	1 ug/L
lead	4 ug/L
manganese	7 ug/L
thallium	5 ug/L
zinc	13 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-5 ug/L
chromium	-8 ug/L
cobalt	-3 ug/L
copper	-9 ug/L
nickel	-10 ug/L
potassium	-29 ug/L
silver	-5 ug/L
sodium	-237 ug/L
vanadium	-2 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria was met. No action was required.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) for calcium (167%) and manganese (109%) in duplicate sample 161SB00702MD exceeded the 35% QC limit for soil samples. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (%R's) of antimony (67.9%) and iron (196%) were outside the 75-125% QC limits for spiked sample 161SB00702MS. All positive and non-detect results for antimony in the associated soil samples in this SDG were flagged as estimated (J) and (UJ). All positive results for iron in the associated soil samples in this SDG were flagged as estimated (J).

IX.) Field Duplicates:

One set of field duplicate samples was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) for samples 161SB002002 and 161CB00202 (analyzed in SDG 6699.2) were:

<u>Analyte</u>	<u>161SB00202, mg/kg</u>	<u>161CB00202, mg/kg</u>	<u>RPD</u>
aluminum	4020	3640	9.9%
calcium	2570	1490	53%
chromium	3.6	2.8	25%
iron	735	596	29%

Since all of the RPD's were within the 60% QC limit for soil samples, no action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (TRPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 161SB00202 and 161CB00202 (analyzed in SDG 6699.2) was not calculable. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS (TRPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was taken.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 161SB00202 and 161CB00202 (analyzed in SDG 6699.2) was not calculable. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0170
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Total Metals

SDG NUMBER: 6751

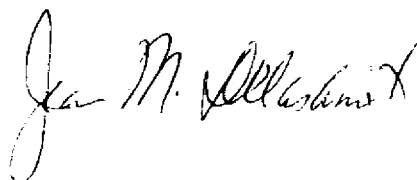
Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Total Metals</u>
166GP01901	6751.01	Water	X	X
166GP02101	6751.02	Water	X	X
166GP021F1	6751.03	Water		X
166GP02601*	6751.06	Water	X	X
166GP02701	6751.08	Water	X	X
166GP02801	6751.09	Water	X	X
166GP02901	6751.10	Water	X	X
166GP03001*	6751.04	Water	X	X
166EP02901	6751.11	Water	X	X
166TP02901	6751.12	Water	X	

* = Corresponding field duplicate samples 166HP02601 and 166HP03001 were analyzed in SDG 6751.1.

E = EQUIPMENT RINSATE BLANK, T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6751 CLP Organics and Inorganics

SAMPLES: 166GP01901, 166GP02101, 166GP021F1, 166GP02601, 166GP02701, 166GP02801,
166GP02901, 166GP03001, 166EP02901, 166TP02901

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC/MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of acetone was 36.1% for the standards analyzed on 11/25/96 on instrument HP2, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples, so no action was required.

Continuing Calibration:

The Percent Differences (%D's) for acetone (40.1%) and 2-butanone (27.7%) in the standards analyzed on 11/26/96 at 14:01 on instrument HP2 exceeded the 25% QC limit. The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GP01901, 166GP02101, 166GP03001 and 166GP02601.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank in this SDG. No action was required.

Trip Blank:

There were no positive detections in the trip blank in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method, trip or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for samples 166GP02601 and 166GP03001 and their duplicate samples 166HP02601 and 166HP03001 (analyzed in SDG 6751.1). No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB3	aluminum	17.0 ug/L	85.0 ug/L
166EP02901	barium	0.70 ug/L	3.50 ug/L
166EP02901	iron	23.1 ug/L	115 ug/L
CCB1	magnesium	6.20 ug/L	31.0 ug/L
CCB1	potassium	49.3 ug/L	246 ug/L
166EP02901	sodium	9.30 ug/L	46.5 ug/L
CCB2	thallium	4.80 ug/L	24.0 ug/L
PBW	vanadium	0.62 ug/L	3.10 ug/L
166EP02901	zinc	24.9 ug/L	124 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water),
166EP02901 = Equipment Rinsate Blank

All results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, preparation or equipment rinsate blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>Action Level</u>
PBW	chromium	-0.83 ug/L	4.15 ug/L
PBW	cobalt	-0.85 ug/L	4.25 ug/L
CCB2	copper	-1.30 ug/L	6.50 ug/L
PBW	nickel	-0.76 ug/L	3.80 ug/L
CCB2	selenium	-2.20 ug/L	11.0 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive results less than 5X the absolute value of the negative blank result and all non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Interference Check Sample criteria were met. No action was required.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	3 ug/L
lead	5 ug/L
manganese	5 ug/L
potassium	121 ug/L
thallium	9 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	5 ug/L
chromium	4 ug/L
cobalt	5 ug/L
copper	8 ug/L
nickel	10 ug/L
selenium	2 ug/L
silver	5 ug/L
sodium	243 ug/L
vanadium	2 ug/L
zinc	18 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) exceeded the 10% QC limit for potassium (23.5%) and sodium (22.8%). Positive results for these analytes in the associated samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 166GP02601 and 166HP02601 (analyzed in SDG 6751.1), and 166GP03001 and 166HP03001 (analyzed in SDG 6751.1), were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>166GP02601, ug/L</u>	<u>166HP02601, ug/L</u>	<u>RPD%</u>
aluminum	93200	7430	170
calcium	9060	8190	10.0
chromium	111	8.1	173
copper	44.3	8.0	139
iron	24800	3240	154
lead	48.2	4.2	168
manganese	231	41.7	139

The results for the analytes whose RPD's exceeded the 30% QC limit in these two samples were flagged as estimated (J).

<u>Analyte</u>	<u>166GP03001, ug/L</u>	<u>166HP03001, ug/L</u>	<u>RPD%</u>
aluminum	4050	69000	178
barium	23.9	141	142
calcium	6350	6950	9.0
chromium	6.4	106	177
copper	6.1	37.8	144
iron	2670	22400	157
lead	4.7	45.8	163
manganese	51	238	129
vanadium	4.5	62.2	173

The results for the analytes whose RPD's exceeded the 30% QC limit in these two samples were flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0171
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level IV
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Total Metals

SDG NUMBER: 6751.1 (Level IV, App. IX)

SAMPLES:

Client	Lab		Volatile	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>Metals</u>
166HP02601*	6751.07	Water	X	X
166HP03001*	6751.05	Water	X	X

* = Corresponding samples 166GP02601 and 166GP03001 were analyzed in SDG 6751.

H = FIELD DUPLICATE

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6751.1 Appendix IX Organics and Inorganics

SAMPLES: 166HP02601, 166HP03001

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 11/26/96 on instrument HP6 for the following compounds:

propionitrile	0.015
acetonitrile	0.020
1,4-dioxane	0.013
isobutyl alcohol	0.046

The results for these compounds in associated samples 166HP02601 and 166HP03001, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) of acetone was 34.3% for the standards analyzed on 11/26/96 on instrument HP6, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples, so no action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 11/26/96 at 14:49 on instrument HP6 for the following compounds:

propionitrile	0.015
acetonitrile	0.019
1,4-dioxane	0.011

The results for these compounds in the associated samples were previously rejected based on low RRF's in the initial calibration. No further action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks in this SDG. No action was required.

Field Blanks:

There were no positive detections in the field blanks, which were analyzed in SDG 6751. No action was required.

Trip Blank:

There were no positive detections in the associated trip blank (analyzed in SDG 6751). No action was required.

TIC's:

There were no TIC's detected in the method, trip or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for samples 166HP02601 and 166HP03001 and their respective field duplicates 166GP02601 and 166GP03001, which were analyzed in SDG 6751. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile, 1,4-dioxane and isobutyl alcohol in the two SDG samples were rejected because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB3	aluminum	17.0 ug/L	85.0 ug/L
166EP02901	barium	0.70 ug/L	3.50 ug/L
166EP02901	iron	23.1 ug/L	115 ug/L
CCB1	magnesium	6.20 ug/L	31.0 ug/L
PBW	potassium	56.1 ug/L	280 ug/L
PBW	sodium	11.0 ug/L	55.0 ug/L
CCB2	thallium	4.80 ug/L	24.0 ug/L
PBW	vanadium	0.62 ug/L	3.10 ug/L
166EP02901	zinc	24.9 ug/L	124 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water),
166EP02901= Equipment Rinsate Blank (analyzed in SDG 6751)

All results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, preparation or equipment rinsate blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>Action Level</u>
CCB2	copper	-1.30 ug/L	6.50 ug/L
PBW	nickel	-0.78 ug/L	3.90 ug/L
CCB2	selenium	-2.20 ug/L	11.0 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive results less than 5X the absolute value of the negative blank result and all non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Interference Check Sample criteria were met. No action was required.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	3 ug/L
lead	5 ug/L
manganese	5 ug/L
potassium	121 ug/L
thallium	9 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-5 ug/L
chromium	-4 ug/L
cobalt	-5 ug/L
copper	-8 ug/L
nickel	-10 ug/L
selenium	-2 ug/L
silver	-5 ug/L
sodium	-243 ug/L
vanadium	-2 ug/L
zinc	-18 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration

comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) exceeded the 10% QC limit for potassium (25.2%) and sodium (21.9%). Positive results for these analytes in the two SDG samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 166HP02601 / 166GP02601 (analyzed in SDG 6751), and 166HP03001 / 166GP03001 (analyzed in SDG 6751), were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>166GP02601, ug/L</u>	<u>166HP02601, ug/L</u>	<u>RPD</u>
aluminum	93200	7430	170%
calcium	9060	8190	10.0%
chromium	111	8.1	173%
copper	44.3	8.0	139%
iron	24800	3240	154%
lead	48.2	4.2	168%
magnesium	5410	1100	132%
manganese	231	41.7	139%
vanadium	50.3	4.9	164%

The results for the analytes whose RPD's exceeded the 30% QC limit for water samples were flagged as estimated (J) in these two samples.

<u>Analyte</u>	<u>166GP03001, ug/L</u>	<u>166HP03001, ug/L</u>	<u>RPD</u>
aluminum	4050	69000	178%
calcium	6350	6950	9.0%
chromium	6.4	106	177%
copper	6.1	37.8	144%
iron	2670	22400	157%
lead	4.7	45.8	163%
magnesium	519	4650	160%

<u>Analyte</u>	<u>166GP03001, ug/L</u>	<u>166HP03001, ug/L</u>	<u>RPD</u>
manganese	51	238	129%
vanadium	4.5	62.2	173%

The results for the analytes whose RPD's exceeded the 30% QC limit for water samples were flagged as estimated (J) in these two samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0179
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRICES: Soil, Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 27701A (Level IV)

SAMPLES:

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
161CB00202	27712.01	Soil	X
162CB00301	27734.02	Soil	X
162CB00502	27734.01	Soil	X
163CB00501	27812.01	Soil	X
164CB00101	27778.01	Soil	X
696CB00101	27701.01	Soil	X
698CB00201	27825.04	Soil	X
162DB00301	27734.03	Water	X
162EB00301	27734.04	Water	X
GDK5000201	27825.01	Soil	X
GDK6000201	27825.02	Soil	X
GDKP000201	27825.03	Water	X

Matrix Codes (4th digit of Client Number) :

5 = BENTONITE BLANK, 6 = SAND BLANK, D =DEIONIZED WATER BLANK,
E = EQUIPMENT RINSATE BLANK, P = PORTABLE WATER BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large, looping initial "J".

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27701A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 161CB00202, 162CB00301, 162EB00301, 162DB00301, 162CB00502,
163CB00501, 164CB00101, 696CB00101, 698CB00201, GDK5000201,
GDK6000201, GDKP000201

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blank at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
DFBLK1,3	OCDD	13.5 pg/L	7.0 ng/kg
DFBLK5	234678-HxCDF	0.3 ng/kg	1.5 ng/kg

Detections of these compounds in associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 162DB00301, equipment rinsate blank 162EB00301, bentonite blank GDK5000201, sand blank GDK6000201 and potable water blank GDKP000201 were analyzed. Three 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
162EB00301	1234678-HpCDD	21 pg/L	11 ng/kg
162EB00301	OCDD	66 pg/L	33 ng/kg
GDK5000201	234678-HxCDF	0.3 ng/kg	1.5 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

No field duplicate set was analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications.

Laboratory flags "X" meaning Estimated Maximum Possible Concentration were changed to "EMPC" during validation.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0179
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRICES: Soil, Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 27840A (Level IV)

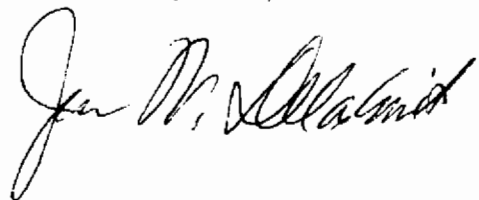
SAMPLES:

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
166CB00102	27840.01	Soil	X
166CB00202	27840.02	Soil	X
GDKCB00502	27866.01	Soil	X
GDKCB00902	27911.01	Soil	X
162E000201	27840.04	Water	X
1627000201	27840.03	Water	X

E = EQUIPMENT RINSATE BLANK, 7 = PVC BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27840A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 166CB00102, 166CB00202, GDKCB00502, GDKCB00902, 162E000201,
1627000201

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
DFBLK1	OCDD	13.5 pg/L	7.0 ng/kg
DFBLK3	234678-HxCDF	0.3 ng/kg	1.5 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Equipment rinsate blank 162E000201 and PVC blank 1627000201 were analyzed. Three 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
1627000201	1234678-HpCDD	16 pg/L	8.0 ng/kg
1627000201	OCDD	126 pg/L	63 ng/kg
1627000201	OCDF	6 pg/L	3.0 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

No field duplicate set was analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications.

PCV blank 1627000201 was reported in the spreadsheets as "Report A." The validator changed this to "Report B" and the e-data were also changed.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0178
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVELS: EPA Level III / Level IV
EPA METHOD: EPA SOW 3-90
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994*

SAMPLE MATRICES: Water and Soil
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Gasoline Range Organics (GRO), Diesel Range Organics (DRO), Total Metals, Cyanide, Hexavalent Chromium (HexaCr), Sulfides, Nitrates

SDG NUMBERS: 6748 (Appendix IX, Level IV)
6749 (Level III)

SAMPLES:

SDG 6748 (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Metals</u>
162CB00301*	6794-12	Soil	X	X	X	X
162CB00301DL	6794-DL	Soil			+	
162CB00502*	6749-09	Soil	X	X	X	X
166HP00401	6749-24	Water	X			X
166HP00601*	6749-17	Water	X			X
162DB00301	6748-01	Water	X	X	X	X
162EB00301	6748-02	Water	X	X	X	X

Client	Lab		Organophos.			Chlorinated
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Pesticides</u>	<u>GRO</u>	<u>DRO</u>	<u>Herbicides</u>
162CB00301*	6794-12	Soil	X	X	X	X
162CB00502*	6749-09	Soil	X	X	X	X
162DB00301	6748-01	Water	X	X	X	X
162EB00301	6748-02	Water	X	X	X	X

Client	Lab					
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>HexaCr</u>	<u>Cyanide</u>	<u>Nitrate</u>	<u>Sulfides</u>
162CB00301*	6794-12	Soil	X	X	X	X
162CB00502*	6749-09	Soil	X	X	X	X
162DB00301	6748-01	Water	X	X	X	X
162EB00301	6748-02	Water	X	X	X	X
162CB00301MS	6794-12MS	Soil	+	+		+
162EB00301MS	6748-02MS	Water	+		+	+

* = Corresponding samples 162SB00301, 162SB00502 and 166GP00601 were analyzed in SDG 6749.

CB / HP = FIELD DUPLICATE, DB = DEIONIZED WATER BLANK, EB = EQUIPMENT RINSATE BLANK, MS = MATRIX SPIKE

SDG 6749 (Level III):

Client	Lab					
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi-volatiles</u>	<u>Pesticides/PCB's</u>	<u>Total Metals</u>
162SB00101	6749-01	Soil	X	X	+	X
162SB00101DL	6749-01DL	Soil			X	
162SB00102	6749-02	Soil	X	X	X	X
162SB00201	6749-03	Soil	X	X	+	X
162SB00201DL	6749-03DL	Soil			X	
162SB00202	6749-04	Soil	X	X	X	X
162SB00301*	6749-10	Soil	X	X	X	X
162SB00301DL	6749-10DL	Soil			+	
162SB00302	6749-11	Soil	X	X	X	X
162SB00401	6749-05	Soil	X	X	X	X
162SB00401RE	6749-05RE	Soil	+			
162SB00402	6749-06	Soil	X	X	X	X
162SB00501	6749-07	Soil	X	X	X	X
162SB00501DL	6749-07DL	Soil			+	
162SB00501RE	6749-07RE	Soil	+	+		
162SB00502*	6749-08	Soil	X	X	X	X
163GP00301	6749-27	Water	X			X
166GP00501	6749-18	Water	X			X
166GP00601*	6749-16	Water	X			X
166GP00801	6749-19	Water	X			X
166GP008F1	6749-20	Water				X
166GP00901	6749-21	Water	X			X
166GP01501	6749-26	Water	X			X
166GP02001	6749-14	Water	X			X
166GP020F1	6749-15	Water				X
166GP02301	6749-22	Water	X			X
166GP02401	6749-23	Water	X			X
166GP02501	6749-25	Water	X			X
162TB00101	6749-13	Soil	X			
162TB00301	6748-03	Water	X			
163TP00301	6749-28	Soil	X			

Client	Lab			
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>GRO</u>	<u>DRO</u>
162SB00101	6749-01	Soil	X	X
162TB00101	6749-13	Soil	X	X
162SB00102	6749-02	Soil	X	X
162SB00201	6749-03	Soil	X	X
162SB00202	6749-04	Soil	X	X
162SB00301*	6749-10	Soil	X	X
162SB00302	6749-11	Soil	X	X
162SB00401	6749-05	Soil	X	X
162SB00402	6749-06	Soil	X	X
162SB00501	6749-07	Soil	X	X
162SB00502*	6749-08	Soil	X	X

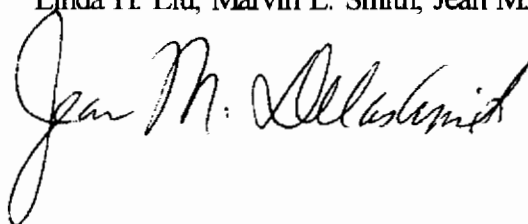
Client	Lab				
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Nitrates</u>	<u>Sulfides</u>	<u>Cyanide</u>
162SB00101	6749-01	Soil	X	X	X
162SB00102	6749-02	Soil	X	X	X
162SB00201	6749-03	Soil	X	X	X
162SB00202	6749-04	Soil	X	X	X
162SB00301*	6749-10	Soil	X	X	X
162SB00302	6749-11	Soil	X	X	X
162SB00401	6749-05	Soil	X	X	X
162SB00402	6749-06	Soil	X	X	X
162SB00501	6749-07	Soil	X	X	X
162SB00502*	6749-08	Soil	X	X	X
162SB00101MS	6749-01MS	Soil		+	
162SB00402MS	6749-06MS	Soil	+		

* = Corresponding samples 162CB00301, 162CB00502 and 166HP00601 were analyzed in SDG 6748.

DL = DILUTION, MS = MATRIX SPIKE, RE = REANALYSIS, TB / TP = TRIP BLANK

DATA REVIEWER(S): Linda H. Liu, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6748 Appendix IX, CLP Organics and Inorganics

SAMPLES: 162CB00301, 162CB00502, 166HP00401, 166HP00601, 162DB00301, 162EB00301,
162CB00301MS, 162EB00301MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Relative Response Factors (RRFs) for propionitrile (0.015), acetonitrile (0.020), isobutyl alcohol (0.046) and 1,4-dioxane (0.013) were below the 0.050 QC limit for the initial calibration analyzed on 11/26/96 on instrument HP6. The non-detect results for these compounds in all associated water samples and field blanks were rejected (R).

The Relative Response Factors (RRFs) for propionitrile (0.018), acetonitrile (0.026) and 1,4-dioxane (0.016) were below the 0.050 QC limit for the initial calibration analyzed on 11/26/96 on instrument HP6. The non-detect result for these compounds in the associated soil samples were rejected (R).

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks, no action was required.

Deionized Water and Equipment Rinsate Blanks:

Chloroform was detected in the deionized water blank (2 ug/L) and the equipment rinsate blank (3 ug/L). Since chloroform was not detected in the associated samples, no action was taken.

Trip Blanks:

There were no positive detections in the trip blanks, analyzed in SDG 6749. No action was taken.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Three sets of field duplicate samples were analyzed by the laboratory. Samples 166HP00601, 162CB00301 and 162CB00502 were analyzed in this SDG, while duplicate samples 166GP00601, 162SB00301 and 162SB00502 were analyzed in SDG 6749. There were no calculable Relative Percent Differences (RPD's) for two sets of field duplicate samples, so no action was required. The RPD was 15% for carbon disulfide in field duplicate samples 166GP00601 and 166HP00601. Since the RPD was within the 30% QC limit for soil samples, no action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile, 1,4-dioxane and isobutyl alcohol were rejected in all water samples in this SDG due to low RRF's in the initial calibration. The non-detect results for propionitrile, acetonitrile and 1,4-dioxane in the soil sample were rejected due to low RRF's in the initial calibration. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.029) and kepone (0.048) in the standards analyzed on 12/15/96 on instrument HP1 were below the 0.050 QC limit. The non-detect results for these compounds in the associated soil samples were rejected (R).

The average Relative Response Factors (RRF's) for isosafrole (0.027), pentachloronitrobenzene (0.046) and aramite (0.049) were below the 0.050 QC limit for the standards analyzed on 12/10/96 on instrument HP3. The non-detect results for these compounds in the associated water field blanks were rejected (R).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blanks, no action was required.

Field Blanks:

There were no positive detections in field blanks 162EB00301 and 162DB00301. No action was required.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Two sets of field duplicate samples were analyzed by the laboratory. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. There were no calculable Relative Percent Differences (RPD's) for field duplicate sample set 162SB00502 / 162CB00502, so no action was required. The calculable RPD's for the field duplicate sample set 162SB00301 / 162CB00301 were:

<u>Compound</u>	<u>162SB00301</u>	<u>162CB00301</u>	<u>RPD</u>
fluoranthene	250 ug/kg	960 ug/kg	117%
pyrene	290 ug/kg	930 ug/kg	105%

The RPD's for these two compounds exceeded the 60% QC limit for soil samples. The positive results for these two compounds in the two samples were flagged as estimated (J).

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for isosafrole, pentachloronitrobenzene and aramite were rejected in the field blanks in this SDG because of low RRF's in the initial and continuing calibrations. The non-detect results for isosafrole and kepone were rejected in the soil samples in this SDG because of low RRF's in

the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in field blanks 162EB00301 and 162DB00301. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Two sets of field duplicate samples were analyzed by the laboratory. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. There were no calculable Relative Percent Differences (RPD's) for field duplicate sample set 162SB00502 / 162CB00502, so no action was required. The calculable RPD's for field duplicate samples 162SB00301 and 162CB00301 were:

<u>Compound</u>	<u>162SB00301</u>	<u>162CB00301</u>	<u>RPD</u>
heptachlor epoxide	2.87 ug/kg	2.24 ug/kg	25%
dieldrin	7.45 ug/kg	6.47 ug/kg	14%
4,4'-DDE	174 ug/kg	144 ug/kg	19%
4,4'-DDD	87.9 ug/kg	72.7 ug/kg	19%
4,4'-DDT	160 ug/kg	137 ug/kg	15%
alpha-chlordane	47.8 ug/kg	33.6 ug/kg	35%
gamma-chlordane	81.8 ug/kg	55.3 ug/kg	39%

Since all RPD's were within the 60% QC limit for soil samples, no action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

The results for 4,4'-DDE, 4,4'-DDD and 4,4'-DDT were above the instrument's linear range in sample 162CB00301. The undiluted values for these compounds were replaced with the dilution analysis results with appropriate flagging (D). The other laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, no action was required.

Continuing Calibration:

All Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

There were no positive detections in the field blanks 162EB00301 and 162DB00301. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Field Blanks:

There were no positive detections in field blanks 162EB00301 and 162DB00301. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Diesel Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed by the laboratory. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the water samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
DB	aluminum	62.9 ug/L	315 ug/L
DB	barium	0.63 ug/L	3.15 ug/L
DB	calcium	31.1 ug/L	156 ug/L
CCB1	cobalt	0.80 ug/L	4.00 ug/L
DB	iron	40.7 ug/L	204 ug/L
CCB1	magnesium	13.0 ug/L	65.0 ug/L
CCB1	nickel	0.80 ug/L	4.00 ug/L
DB	sodium	68.2 ug/L	341 ug/L
DB	zinc	12.8 ug/L	64.0 ug/L

CCB = Continuing Calibration Blank, DB = Deionized Water Blank

All results greater than the IDL but less than 5X the blank amount for which the contaminated blank was an associated calibration or deionized water blank were flagged as undetected (U).

The following blank results represent the highest detections associated with the soil samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DB	aluminum	62.9 ug/L	62.9 mg/kg
DB	barium	0.63 ug/L	0.63 mg/kg
PBS	calcium	16.8 mg/kg	84.0 mg/kg
PBS	chromium	0.21 mg/kg	1.05 mg/kg
PBS	cobalt	0.18 mg/kg	0.90 mg/kg
DB	iron	40.7 ug/L	40.7 mg/kg
CCB1	magnesium	13.0 ug/L	13.0 mg/kg
CCB1	nickel	0.80 ug/L	0.80 mg/kg
PBS	silver	0.22 mg/kg	1.10 mg/kg
DB	sodium	68.2 ug/L	68.2 mg/kg
DB	zinc	12.8 ug/L	12.8 mg/kg

CCB = Continuing Calibration Blank, DB = Deionized Water Blank

PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount, after correction for Percent Solids, for which the contaminated blank was an associated calibration, deionized water or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.	
			Water	Soil
ICB	antimony	-1.90 ug/L	9.50 ug/L	1.90 mg/kg
PBW	cobalt	-0.74 ug/L	3.70 ug/L	0.74 mg/kg
PBW	copper	-1.73 ug/L	8.65 ug/L	1.73 mg/kg
CCB4	mercury	-0.10 ug/L	0.50 ug/L	0.10 mg/kg
PBW	nickel	-0.84 ug/L	4.20 ug/L	0.84 mg/kg
ICB	potassium	-29.0 ug/L	145 ug/L	29.0 mg/kg
CCB2	thallium	-3.70 ug/L	18.5 ug/L	3.70 mg/kg
CCB2	vanadium	-0.50 ug/L	2.50 ug/L	0.50 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,

PBW = Preparation Blank (Water)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	5 ug/L
manganese	11 ug/L
potassium	81 ug/L
thallium	5 ug/L
zinc	6 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A absolute concentrations greater than the IDL:

chromium	-6 ug/L
copper	-9 ug/L
nickel	-6 ug/L
silver	-3 ug/L
sodium	-208 ug/L
vanadium	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) of aluminum (69.8%), antimony (77.4%), iron (76.1%) and tin (78.0 %) were below the 80-120% QC limits. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Three sets of field duplicate samples were analyzed. Samples 166HP00601, 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 166GP00601, 162SB00301 and 162SB00502 were analyzed in SDG 6749. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>166GP00601, ug/L</u>	<u>166HP00601, ug/L</u>	<u>RPD</u>
aluminum	162000	22600	151%
calcium	12600	11400	10%
chromium	86.5	14.5	143%
iron	12800	3880	107%
lead	74.5	11.6	146%
manganese	91.3	36.5	30%
selenium	8.7	6.4	30%

The Relative Percent Differences (RPD's) for aluminum, chromium, iron and lead exceeded the 30% QC limit for water samples. The positive detections of these analytes in water samples 166GP00601 and 166HP00601 were flagged as estimated (J).

<u>Analyte</u>	<u>162SB00301, mg/kg</u>	<u>162CB00301, mg/kg</u>	<u>RPD</u>
aluminum	8330	8040	4%
chromium	10.0	11.2	11%
copper	6.9	8.9	25%
iron	3780	3570	6%
lead	11.2	13.6	19%
manganese	6.3	6.5	3%
mercury	0.12	0.19	45%
vanadium	12.0	11.3	6%
zinc	30.8	24.9	21%

<u>Analyte</u>	<u>162SB00502, mg/kg</u>	<u>162CB00502, mg/kg</u>	<u>RPD</u>
aluminum	8980	8210	9%
chromium	5.9	6.1	3%
iron	3120	2830	10%
lead	3.1	3.3	6%
manganese	8.4	7.7	9%

Since all RPD's were within the 60% QC limit for soil samples, no action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

WET CHEMISTRY ANALYSES

CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met, so no action was taken.

VI.) Matrix Spike Recovery (MS):

The MS Percent Recovery criteria was met, so no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

Holding times from sampling date to analysis were 23 days for soil samples and 8 days for field blanks, which exceeded the 24-hour QC limit. The non-detect results for all soil samples were flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Hexavalent chromium was not detected in the method blank, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Percent Recovery criteria were met, so no action was taken.

VII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

NITRATES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met, so no action was taken.

VI.) Matrix Spike Recovery (MS):

All Percent Recovery criteria were met, so no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while duplicate samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. The Relative Percent Differences (RPD's) for these field duplicate samples were not calculable, so no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met, so no action was taken.

VI.) Matrix Spike Recovery (MS):

All Percent Recovery criteria were met, so no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162CB00301 and 162CB00502 were analyzed in this SDG, while corresponding samples 162SB00301 and 162SB00502 were analyzed in SDG 6749. The Relative Percent Differences (RPD's) for these field duplicate samples were not calculable, so no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6749, CLP Organics and Inorganics

SAMPLES: 162SB00101, 162SB00101DL, 162SB00102, 162SB00201, 162SB00201DL, 162SB00202, 162SB00301, 162SB00301DL, 162SB00302, 162SB00401, 162SB00401RE, 162SB00402, 162SB00501, 162SB00501DL, 162SB00501RE, 162SB00502, 163GP00301, 166GP00501, 166GP00601, 166GP00801, 166GP008F1, 166GP00901, 166GP01501, 166GP02001, 166GP020F1, 166GP02301, 166GP02401, 166GP02501, 162TB00101, 162TB00301, 163TP00301, 162SB00101MS, 162SB00402MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of acetone was 36.1% for the initial calibration analyzed on 11/25/96 on instrument HP2, which exceeded the 30% QC limit. Since there were no positive detections of this compound in the associated water samples, no action was taken.

Continuing Calibration:

The Percent Difference (%D) of acetone was 26.2% for the continuing standard analyzed on 11/26/96 at 00:52 on instrument HP2, which exceeded the 25% QC limit. The results for acetone in the associated water samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GP02001 and 166GP00601.

The Percent Differences (%D's) of acetone (40.1%) and 2-butanone (27.7%) exceeded the 25% QC limit for the continuing standard analyzed on 11/26/96 at 14:01 on instrument HP2. The results for acetone and 2-butanone in the associated water samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GP00501, 166GP00801, 166GP00901, 166GP02301, 166GP02401, 166GP02501, 166GP01501 and 163GP00301.

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether were 0.043 and 0.048, respectively, for the continuing calibrations analyzed on 11/26/96 at 19:01 and 11/27/96 at 12:19 on instrument HP4,

which were below the 0.050 QC limit. The non-detect results for 2-chloroethyl vinyl ether in all associated soil samples and trip blanks were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/26/96 at 19:01 on instrument HP4 for the following compounds:

acetone	53.4%
2-chloroethyl vinyl ether	50.3%
2-butanone	57.0%
2-hexanone	36.3%

The results for 2-chloroethyl vinyl ether were previously rejected due to very low RRF's in this continuing calibration. All results for acetone, 2-butanone and 2-hexanone in all associated soil samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 2 ug/kg in the soil method blank VBLK1127A. Since methylene chloride was not detected in the associated samples, no action was taken.

Field Blanks:

Chloroform was detected in the deionized water blank (2 ug/L) and the equipment rinsate blank (3 ug/L), which were analyzed in SDG 6748. Since chloroform was not detected in the associated samples, no action was taken.

Trip Blanks:

There were no positive detections in the trip blanks. No action was taken.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Three sets of field duplicate samples were analyzed. Samples 166GP00601, 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 166HP00601, 162CB00301 and 162CB00502 were analyzed in SDG 6748. The Relative Percent Difference (RPD) was 15% for carbon disulfide in field duplicate samples 166GP00601 and 166HP00601. Since the RPD was within the 30% QC limit, no action was taken. There were no calculable Relative Percent Differences (RPD's) for the other two sets of field duplicate samples, so no action was required.

IX.) Internal Standards Performance (ISTD):

The internal standard area counts were below the 50-200% QC limits for following samples:

<u>Client Sample ID</u>	<u>1,4-Dichlorobenzene-d4</u>
162SB00401	49%
162SB00501	44%
162SB00401RE	39%
162SB00501RE	39%

Since there were no compounds quantitated on this internal standard, no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected.

The non-detect results for 2-chloroethyl vinyl ether in the soil samples in this SDG were rejected due to low RRF's in the continuing calibration. The original analyses of samples 162SB00401 and 162SB00501 were considered by the validator to be of preferable data quality compared to the reanalyses because of better internal standard area counts. Both samples were analyzed within the required holding times. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standard analyzed on 11/27/96 on instrument HP1 for the following compounds:

benzoic acid	32.0%
2,4-dinitrophenol	49.7%
4,6-dinitro-2-methylphenol	35.7%

Since these compounds were not detected in the associated samples, no action was taken.

The Percent Relative Standard Deviation (%RSD) of 2,4-dinitrophenol was 36.6% which exceeded the 30% QC limit for the standard analyzed on 11/28/96 on instrument HP7. Since this compound was not detected in the associated samples, no action was taken.

Continuing Calibrations:

The Percent Difference (%D) of benzoic acid was 26.1%, which exceeded the 25% QC limit for the standard analyzed on 11/29/96 at 13:13 on instrument HP1. The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 162SB00302, 162SB00502, 162SB00402, 162SB00401, 162SB00202, 162SB00301 and 162SB00501.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks, so no action was required.

Field Blanks:

There were no positive detections in field blanks 162EB00301 and 162DB00301, which were analyzed in SDG 6748. No action was required.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) exceeded their respective QC limits for the following sample:

Client	2-fluorobiphenol	2,4,6-tribromophenol
<u>Sample ID</u>	<u>(30-115%)</u>	<u>(19-122%)</u>
162SB00501	117%	137%

Since all acid fraction results were non-detects in sample 162SB00501, no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Two sets of field duplicate samples were analyzed by the laboratory. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 162SB00502 and 162CB00502, so no action was required. The calculable Relative Percent Differences (RPD's) for the field duplicate samples 162SB00301 and 162CB00301 were:

<u>Compound</u>	<u>162SB00301</u>	<u>162CB00301</u>	<u>RPD</u>
fluoranthene	960 ug/kg	250 ug/kg	117%
pyrene	930 ug/kg	290 ug/kg	105%

The RPD's for these two compounds exceeded the 60% QC limit for soil samples. The positive results for these two compound in the two field duplicate samples were flagged as estimated (J)

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected.

The original analysis of sample 162SB00501 was considered by the validator to be of preferable data quality compared to the reextraction / reanalysis because of its better holding time. All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in field blanks 162EB00301 and 162DB00301, which were analyzed in SDG 6748. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 162SB00502 and 162CB00502, so no action was required. The calculable RPD's for field duplicate samples 162SB00301 and 162CB00301 were:

<u>Compound</u>	<u>162SB00301</u>	<u>162CB00301</u>	<u>RPD</u>
heptachlor epoxide	2.87 ug/kg	2.24 ug/kg	25%
dieldrin	7.45 ug/kg	6.47 ug/kg	14%
4,4'-DDE	174 ug/kg	144 ug/kg	19%
4,4'-DDD	87.9 ug/kg	72.7 ug/kg	19%
4,4'-DDT	160 ug/kg	137 ug/kg	15%
alpha-chlordane	47.8 ug/kg	33.6 ug/kg	35%
gamma-chlordane	81.8 ug/kg	55.3 ug/kg	39%

Since all RPD's were within the 60% QC limit for soil samples, no action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for the following compounds and associated samples:

<u>Sample</u>	<u>Compound</u>	<u>%D</u>
162SB00501	endrin aldehyde	192%
	gamma-chlordane	232%
162SB00301	gamma-chlordane	187%
162SB00302	alpha-chlordane	100%

The associated positive sample results for compounds with %D's from 70% to 300% were flagged as estimated (J).

X.) Pesticide Cleanup Check:

Florisol Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected.

Samples 162SB00101 and 162SB00201 were more dilute than samples 162SB00101DL and 162SB00201DL. The "DL" analyses were chosen for validation with the original, more dilute analyses being treated as the dilutions.

The results for 4,4'-DDE and 4,4'-DDT were above the instrument's linear range in samples 162SB00101DL and 162SB00201DL. The undiluted values for these compounds were replaced with the more diluted analysis results with appropriate flagging (D). The results for 4,4'-DDE, 4,4'-DDD and 4,4'-DDT were above the instrument's linear range in samples 162SB00301 and 162SB00501. The undiluted values for these compounds were replaced with the diluted analysis results with appropriate flagging (D). All laboratory data were acceptable with qualifications.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG, so no action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

X.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected.

All other laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Diesel Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG, so no action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

X.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected.

All other laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the water samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
DB	aluminum	62.9 ug/L	315 ug/L
CCB2	antimony	1.90 ug/L	9.50 ug/L
DB	barium	0.63 ug/L	3.15 ug/L
ICB	beryllium	0.10 ug/L	0.50 ug/L
ICB	cadmium	0.30 ug/L	1.50 ug/L
DB	calcium	31.1 ug/L	156 ug/L
DB	iron	40.7 ug/L	204 ug/L
CCB3	magnesium	4.80 ug/L	24.0 ug/L
CCB3	potassium	27.7 ug/L	139 ug/L
PBW	selenium	2.03 ug/L	10.2 ug/L
DB	sodium	68.2 ug/L	341 ug/L
ICB	thallium	4.30 ug/L	21.5 ug/L
ICB	vanadium	0.60 ug/L	3.00 ug/L
PBW	zinc	15.2 ug/L	75.8 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
DB = Deionized Water Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount for which the contaminated blank was an associated calibration or deionized water blank were flagged as undetected (U).

The following blank results represent the highest detections associated with the soil samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
DB	aluminum	62.9 ug/L	62.9 mg/kg
CCB2	antimony	1.90 ug/L	1.90 mg/kg
DB	barium	0.63 ug/L	0.63 mg/kg
ICB	beryllium	0.10 ug/L	0.10 mg/kg
ICB	cadmium	0.30 ug/L	0.30 mg/kg
DB	calcium	31.1 ug/L	31.1 mg/kg
DB	iron	40.7 ug/L	40.7 mg/kg
CCB3	magnesium	4.80 ug/L	4.80 mg/kg
CCB3	potassium	27.7 ug/L	27.7 mg/kg
PBS	selenium	0.42 mg/kg	2.10 mg/kg
DB	sodium	68.2 ug/L	68.2 mg/kg
ICB	thallium	4.30 ug/L	4.30 mg/kg
ICB	vanadium	0.60 ug/L	0.60 mg/kg
DB	zinc	12.8 ug/L	12.8 mg/kg

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
DB = Deionized Water Blank, PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount, after correction for %Solids, for which the contaminated blank was an associated calibration, deionized water or preparation blank were

flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.	
			Water	Soil
CCB4	calcium	-46.8 ug/L	234 ug/L	46.8 mg/kg
CCB4	chromium	-2.00 ug/L	10.0 ug/L	2.00 mg/kg
CCB4	cobalt	-2.70 ug/L	13.5 ug/L	2.70 mg/kg
CCB4	copper	-2.20 ug/L	11.0 ug/L	2.20 mg/kg
CCB4	mercury	-0.10 ug/L	0.50 ug/L	0.10 mg/kg
CCB4	nickel	-2.00 ug/L	10.0 ug/L	2.00 mg/kg
CCB5	potassium	-69.0 ug/L	345 ug/L	69.0 mg/kg
ICB	silver	-2.00 ug/L	10.0 ug/L	2.00 mg/kg
CCB6	sodium	-7.20 ug/L	36.0 ug/L	7.20 mg/kg
CCB1	zinc	-1.60 ug/L	8.00 ug/L	1.60 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	4 ug/L
manganese	10 ug/L
potassium	102 ug/L
thallium	8 ug/L
zinc	2 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations above the IDL:

barium	-4 ug/L
chromium	-9 ug/L
cobalt	-5 ug/L
copper	-9 ug/L
nickel	-9 ug/L
silver	-6 ug/L
sodium	-235 ug/L
vanadium	-4 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) of chromium (17.3%) and zinc (10.8%) exceeded the 10% QC limit for diluted soil sample 162SB00101L. Positive results for these two analytes in all associated soil samples were flagged as estimated (J).

The Serial Dilution Percent Differences (%D's) of potassium (22.7%), sodium (18.2%) and zinc (11.2%) exceeded the 10% QC limit in diluted water sample 166GP02001L. Positive results for these three analytes in all associated water samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Three sets of field duplicate samples were analyzed. Samples 166GP00601, 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 166HP00601, 162CB00301 and 162CB00502 were analyzed in SDG 6748. The calculable Relative Percent Differences (RPD's) were:

Analyte	166GP00601, ug/L	166HP00601, ug/L	RPD
aluminum	162000	22600	151%
calcium	12600	11400	10%
chromium	86.5	14.5	143%
iron	12800	3880	107%
lead	74.5	11.6	146%
manganese	91.3	36.5	30%
selenium	8.7	6.4	30%
zinc	80.8	38.0	72%

Analyte	162SB00301, mg/kg	162CB00301, mg/kg	RPD
aluminum	8330	8040	4%
chromium	10.0	11.2	11%
copper	6.9	8.9	25%
iron	3780	3570	6%
lead	11.2	13.6	19%
manganese	6.3	6.5	3%

<u>Analyte</u>	<u>162SB00301, mg/kg</u>	<u>162CB00301, mg/kg</u>	<u>RPD</u>
mercury	0.12	0.19	45%
vanadium	12.0	11.3	6%
zinc	30.8	24.9	21%

<u>Analyte</u>	<u>162SB00502, mg/kg</u>	<u>162CB00502, mg/kg</u>	<u>RPD</u>
aluminum	8980	8210	9%
chromium	5.9	6.1	3%
iron	3120	2830	10%
lead	3.1	3.3	6%
manganese	8.4	7.7	9%

The Relative Percent Differences (RPD's) for aluminum, chromium, iron, lead, and zinc exceeded the 30% QC limit for the water samples. The positive detections of these analytes in water sample 166GP00601 were flagged as estimated (J). Since all RPD's were within the 60% QC limit for the soil samples, no further action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected. All other laboratory data were acceptable with qualifications.

WET CHEMISTRY ANALYSES

CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

VIII.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected. All other laboratory data were acceptable without qualification.

NITRATES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met, so no action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Percent Recovery criteria were met, so no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

VIII.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected. All other laboratory data were acceptable without qualification.

SULFIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met, so no action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Percent Recovery criteria were met, so no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 162SB00301 and 162SB00502 were analyzed in this SDG, while duplicate samples 162CB00301 and 162CB00502 were analyzed in SDG 6748. There were no calculable Relative Percent Differences (RPD's) for these field duplicate samples, so no action was required.

VIII.) Overall Assessment of Data/General:

Sample 162SB00301 was incorrectly identified as "162SI00301" on the spreadsheet. This error was corrected by the validator, but the electronic data file was not corrected. All other laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0179
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRICES: Soil, Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 27701A (Level IV)

SAMPLES:

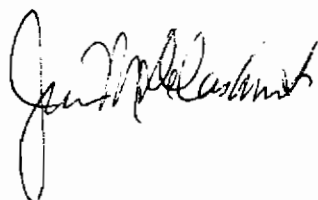
Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	PCDD/ <u>PCDF</u>
161CB00202	27712.01	Soil	X
162CB00301	27734.02	Soil	X
162CB00502	27734.01	Soil	X
163CB00501	27812.01	Soil	X
164CB00101	27778.01	Soil	X
696CB00101	27701.01	Soil	X
698CB00201	27825.04	Soil	X
162DB00301	27734.03	Water	X
162EB00301	27734.04	Water	X
GDK5000201	27825.01	Soil	X
GDK6000201	27825.02	Soil	X
GDKP000201	27825.03	Water	X

Matrix Codes (4th digit of Client Number) :

5 = BENTONITE BLANK, 6 = SAND BLANK, D =DEIONIZED WATER BLANK,
E = EQUIPMENT RINSATE BLANK, P = PORTABLE WATER BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit", written over the "RELEASE SIGNATURE:" label.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27701A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 161CB00202, 162CB00301, 162EB00301, 162DB00301, 162CB00502,
163CB00501, 164CB00101, 696CB00101, 698CB00201, GDK5000201,
GDK6000201, GDKP000201

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blank at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
DFBLK1,3	OCDD	13.5 pg/L	7.0 ng/kg
DFBLK5	234678-HxCDF	0.3 ng/kg	1.5 ng/kg

Detections of these compounds in associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 162DB00301, equipment rinsate blank 162EB00301, bentonite blank GDK5000201, sand blank GDK6000201 and potable water blank GDKP000201 were analyzed. Three 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
162EB00301	1234678-HpCDD	21 pg/L	11 ng/kg
162EB00301	OCDD	66 pg/L	33 ng/kg
GDK5000201	234678-HxCDF	0.3 ng/kg	1.5 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

No field duplicate set was analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications.

Laboratory flags "X" meaning Estimated Maximum Possible Concentration were changed to "EMPC" during validation.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0179
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRICES: Soil, Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 27840A (Level IV)

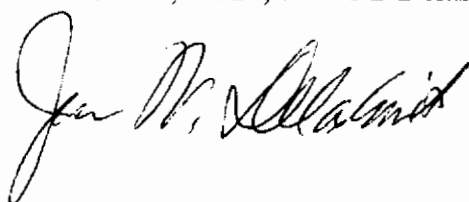
SAMPLES:

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
166CB00102	27840.01	Soil	X
166CB00202	27840.02	Soil	X
GDKCB00502	27866.01	Soil	X
GDKCB00902	27911.01	Soil	X
162E000201	27840.04	Water	X
1627000201	27840.03	Water	X

E = EQUIPMENT RINSATE BLANK, 7 = PVC BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27840A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 166CB00102, 166CB00202, GDKCB00502, GDKCB00902, 162E000201,
1627000201

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
DFBLK1	OCDD	13.5 pg/L	7.0 ng/kg
DFBLK3	234678-HxCDF	0.3 ng/kg	1.5 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Equipment rinsate blank 162E000201 and PVC blank 1627000201 were analyzed. Three 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
1627000201	1234678-HpCDD	16 pg/L	8.0 ng/kg
1627000201	OCDD	126 pg/L	63 ng/kg
1627000201	OCDF	6 pg/L	3.0 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

No field duplicate set was analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications.

PCV blank 1627000201 was reported in the spreadsheets as "Report A." The validator changed this to "Report B" and the e-data were also changed.

VALIDATA

Chemical Services, Inc.

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(770) 923-3890

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0182
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVELS: EPA Level III / Level IV, Appendix IX
EPA METHOD: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals, Cyanide, Hexavalent Chromium (HexaCr), Total Recoverable Petroleum Hydrocarbons - Diesel Range Organics (TRPH-DRO), Total Recoverable Petroleum Hydrocarbons - Gasoline Range Organics (TRPH-GRO)

SDG NUMBERS: 6754.1 (Level IV, App. IX)
6754 (Level III)

SAMPLES:

SDG 6754.1 (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Organophos. Pesticides
164CB00101*	6754.09	Soil	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorinated Herbicides	Total Metals	Cyanide	HexaCr.
164CB00101*	6754.09	Soil	X	X	X	X
164CB00101MS	6754.09MS	Soil				+
164CB00101MD	6754.09MD	Soil				+

Client	Lab			
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>TRPH-DRO</u>	<u>TRPH-GRO</u>
164CB00101*	6754.09	Soil	X	X

* = Corresponding sample 164SB00101 was analyzed in SDG 6754.

C = FIELD DUPLICATE, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE

SDG 6754 (Level III):

Client	Lab		Volatile	Semi-	Pesticides/	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Metals</u>
164SB00101*	6754.07	Soil		X		X
164SB00102	6754.08	Soil		X		X
164SB00201	6754.01	Soil		X		X
164SB00201RE	6754.01RE	Soil		+		
164SB00202	6754.02	Soil		X		X
164SB00301	6754.03	Soil		X		X
164SB00302	6754.04	Soil		X		X
164SB00401	6754.05	Soil		X		X
164SB00402	6754.06	Soil		X		X
164DB00101	6754.11	Water	X	X	X	X
164EB00101	6754.12	Water	X	X	X	X
164TB00101	6754.10	Soil	X			
164TB00102	6754.13	Water	X			

Client	Lab				
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Cyanide</u>	<u>TRPH-DRO</u>	<u>TRPH-GRO</u>
164SB00101	6754.07	Soil		X	X
164SB00102	6754.08	Soil		X	X
164SB00201	6754.01	Soil		X	X
164SB00202	6754.02	Soil		X	X
164SB00301	6754.03	Soil		X	X
164SB00302	6754.04	Soil		X	X
164SB00401	6754.05	Soil		X	X
164SB00402	6754.06	Soil		X	X
164DB00101	6754.11	Water	X	X	X
164EB00101	6754.12	Water	X	X	X
164TB00102	6754.13	Water		X	X
164SB00102MS	6754.08MS	Soil		+	
164SB00102MSD	6754.08MD	Soil		+	

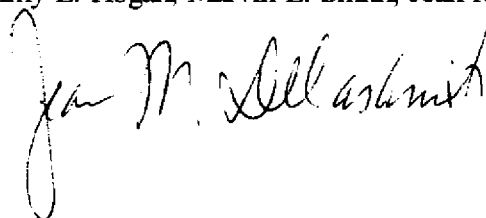
* = Field duplicate sample 164CB00101 was analyzed in SDG 6754.1.

+ = Non-billable analysis

DB = DEIONIZED WATER BLANK, EB = EQUIPMENT RINSATE BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TB = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

Handwritten signature of Jean M. Delashmit in cursive script.

Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6754.1 Appendix IX CLP Organics and Inorganics

SAMPLE: 164CB00101

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 11/26/96 on instrument HP6 for the following compounds:

propionitrile	0.018
acetonitrile	0.026
1,4-dioxane	0.016

The results for these compounds in associated sample 164CB00101, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks associated with this SDG. No action was required.

Deionized Water and Equipment Rinsate Blanks:

Chloroform was detected at 2 ug/L in deionized water blank 164DB00101 and 3 ug/L in equipment rinsate blank 164EB00101, which were analyzed in SDG 6754. Since there were no positive results for

this compound in the associated samples, no action was required.

Trip Blanks:

Acetone was detected at 9 ug/kg in trip blank 164TB00101, which was analyzed in SDG 6754. The positive result for this compound in associated sample 164CB00101, which was less than 10X the blank amount, was flagged as undetected (U) with the result less than the CRQL being raised to the CRQL.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in sample 164CB00101 because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 12/15/96 on instrument HP1 for isosafrole (0.029) and kepone (0.048). The non-detect results for these compounds in associated sample 164CB00101 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/15/96 on instrument HP1 for the following compounds:

1-naphthylamine	41.4%
kepone	55.3%
n-nitrosodiphenylamine	43.4%
diallate	46.7%
methapyrilene	55.7%
3,3'-dichlorobenzidine	78.1%
famphur	37.0%
hexachlorophene	33.9%

There were no positive results for these compounds in the associated sample. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in two field blanks for this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside their respective QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for isosafrole and kepone were rejected in sample 164CB00101 because of low RRF's in the initial calibration. All other laboratory data were acceptable without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks, which were analyzed in SDG 6754. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Recovery criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBS	aluminum	15.1 mg/kg	75.0 mg/kg
PBS	calcium	4.94 mg/kg	24.7 mg/kg
CCB1	silver	2.20 ug/L	2.20 mg/kg
PBS	sodium	7.62 mg/kg	38.1 mg/kg
PBS	zinc	3.63 mg/kg	18.2 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amounts (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB1	barium	-0.10 ug/L	0.10 mg/kg
PBS	beryllium	-0.02 mg/kg	0.10 mg/kg
CCB4	copper	-1.50 ug/L	1.50 mg/kg
CCB2	magnesium	-4.00 ug/L	4.00 mg/kg
CCB1	mercury	-0.10 ug/L	0.10 mg/kg
CCB1	nickel	-0.10 ug/L	0.10 mg/kg
CCB2	potassium	-53.2 ug/L	53.2 mg/kg
CCB1	vanadium	-0.60 ug/L	0.60 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at positive concentrations greater than the IDL:

antimony	2 ug/L
arsenic	3 ug/L
lead	6 ug/L
manganese	6 ug/L
potassium	139 ug/L
selenium	2 ug/L
thallium	8 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-3 ug/L
cobalt	-4 ug/L
copper	-9 ug/L

nickel	-9 ug/L
silver	-4 ug/L
sodium	-238 ug/L
vanadium	-2 ug/L
zinc	-16 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) for copper was 14.3%, which exceeded the 10% QC limit. The positive result for this analyte in the associated sample was flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The Percent Recovery (%R) of antimony was 73.4% for the soil LCS, which was below the 80-120% QC limit. The non-detect result for this analyte in sample 164CB00101 was flagged as estimated (UJ).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, 164SB00101 (analyzed in SDG 6754) and 164CB00101, was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>164SB00101, mg/kg</u>	<u>164CB00101, mg/kg</u>	<u>RPD</u>
aluminum	7710	7020	9.4%
arsenic	2.1	2.0	4.9%
barium	11.3	10.5	7.3%
calcium	1310	1230	6.3%
chromium	14.7	14.9	1.3%
copper	11.3	9.4	18.3%
iron	3120	2970	4.9%
lead	25.4	25.6	0.8%
magnesium	304	245	21.5%
manganese	10.1	9.7	4.0%
nickel	2.7	3.1	13.8%
potassium	124	103	18.5%
sodium	34.3	42.4	21.1%
vanadium	10.6	10.2	3.8%
zinc	58.2	49.9	15.4%

No action was required, since all of the RPD's were within the 60% QC limit for soil samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding time to analysis was 17 days for soil sample 164CB00101, which exceeded the 24 hour QC limit. The non-detect result for sample 164CB00101 was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Hexavalent chromium was not detected in the method blank, so no action was required.

IV.) Laboratory Check Samples (LCS):

There were no LCS's analyzed in this SDG. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

No field duplicate samples were associated with this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (TRPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks, which were analyzed in SDG 6754. No action was required.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 164SB00101 (analyzed in SDG 6754) and 164CB00101 was 1.0%, which was within the 60% QC limit for soil samples. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS (TRPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks, which were analyzed in SDG 6754. No action was required.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6754 CLP Organics and Inorganics

SAMPLES: 164SB00101, 164SB00102, 164SB00201, 164SB00201RE, 164SB00202, 164SB00301, 164SB00302, 164SB00401, 164SB00402, 164DB00101, 164EB00101, 164TB00101, 164TB00102, 164SB00102MS, 164SB00102MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for the standards analyzed on 11/25/96 on instrument HP2 exceeded the 30% QC limit for acetone (36.1%). There were no positive results for this compound in the associated samples, so no action was required.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.043, which was below the 0.050 QC limit for the standards analyzed on 11/26/96 at 19:01 on instrument HP4. The non-detect result for this compound in associated trip blank 164TB00101 was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/26/96 at 19:01 on instrument HP4 for the following compounds:

2-chloroethyl vinyl ether	50.3%
2-butanone	57.0%
acetone	53.4%
2-hexanone	36.3%

Since the only associated sample was a field blank, no action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized Water and Equipment Rinsate Blanks:

Chloroform was detected at 2 ug/L in deionized water blank 164DB00101 and 3 ug/L in equipment rinsate blank 164EB00101, which were analyzed in SDG 6754. Since there were no positive results for this compound in the associated samples, no action was required.

Trip Blanks:

There were no positive detections in the trip blanks. No action was necessary.

TIC's:

There were no TIC's detected in the method, trip or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect result for 2-chloroethyl vinyl ether in trip blank 164TB00101 was rejected based on a low RRF in the continuing calibration. All other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 11/27/96 on instrument HP1 for the following compounds:

benzoic acid	32.0%
2,4-dinitrophenol	49.7%
4,6-dinitro-2-methylphenol	35.7%

These compounds were not detected in the associated samples, so no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/29/96 at 13:13 on instrument HP1 for the following compounds:

benzoic acid	26.1%
benzo(k)fluoranthene	27.7%

The non-detect results for these compounds in associated samples 164SB00302 and 164SB00301, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. Several Percent Recoveries were outside their respective QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Area Count Recovery (%R) of perylene-d12 was 45.1% for sample 164SB00201, which was below the 50-200% QC limits. All results for the compounds quantitated using this ISTD, which consisted entirely of non-detects, were flagged as estimated (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 164SB00201 was considered by the validator to be of preferable data quality to the reanalysis due to its better holding time. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction in this SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
164DB00101	aluminum	65.3 ug/L	65.3 mg/kg
164DB00101	barium	0.54 ug/L	0.54 mg/kg
CCB3	beryllium	0.10 ug/L	0.10 mg/kg
PBS	calcium	5.92 mg/kg	29.6 mg/kg
PBS	iron	7.35 mg/kg	36.8 mg/kg
PBS	potassium	16.9 mg/kg	84.5 mg/kg
CCB1	silver	2.20 ug/L	2.20 mg/kg
164DB00101	sodium	8.40 ug/L	8.40 mg/kg
PBS	vanadium	0.08 mg/kg	0.40 mg/kg
164DB00101	zinc	6.60 ug/L	6.60 mg/kg

CCB = Continuing Calibration Blank, PBS= Preparation Blank (Soil),
164DB00101 = Deionized Water Blank

All results greater than the IDL but 5X the blank amounts (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration, preparation or deionized water blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
PBW	arsenic	-1.96 ug/L	1.96 mg/kg
CCB3	copper	-1.40 ug/L	1.40 mg/kg
CCB2	magnesium	-4.00 ug/L	4.00 mg/kg
CCB1	mercury	-0.10 ug/L	0.10 mg/kg
PBW	nickel	-1.41 ug/L	1.41 mg/kg

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	2 ug/L
arsenic	3 ug/L
lead	6 ug/L
manganese	6 ug/L
potassium	139 ug/L
selenium	2 ug/L
thallium	8 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-3 ug/L
cobalt	-4 ug/L
copper	-9 ug/L
nickel	-9 ug/L
silver	-4 ug/L
sodium	-238 ug/L
vanadium	-2 ug/L
zinc	-16 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) was 14.5% for sodium in the soil serial dilution analysis. Since this %D exceeded the 10% QC limit, all positive results for sodium in the associated soil samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The Percent Recoveries (%R's) of antimony (77.6%) and tin (71.3%) in the soil LCS were below the 80-120% QC limits. All positive and non-detect results for these analytes in the soil samples in this SDG were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, 164SB00101 and 164CB00101 (analyzed in SDG6754.1), was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	164SB00101, mg/kg	164CB00101, mg/kg	RPD
aluminum	7710	7020	9.4%
arsenic	2.1	2.0	4.9%
barium	11.3	10.5	7.3%
calcium	1310	1230	6.3%
chromium	14.7	14.9	1.3%
copper	11.3	9.4	18.3%
iron	3120	2970	4.9%
lead	25.4	25.6	0.8%
magnesium	304	245	21.5%
manganese	10.1	9.7	4.0%
nickel	2.7	3.1	13.8%
potassium	124	103	18.5%
sodium	34.3	42.4	21.1%
vanadium	10.6	10.2	3.8%
zinc	58.2	49.9	15.4%

No action was required, since all of the RPD's were within the 60% QC limit for soil samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (TRPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was required.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 164SB00101 and 164CB00101 (analyzed in SDG 6754.1) was 1.0%, which was within the 60% QC limit for soil samples. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS (TRPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was required.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0183
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Soil
TYPES OF ANALYSES: Semivolatile Organics, Total Metals, Total Recoverable Petroleum Hydrocarbons - Diesel Range Organics (TRPH-DRO), Total Recoverable Petroleum Hydrocarbons - Gasoline Range Organics (TRPH-GRO)

SDG NUMBER: 6777 (Level III)

SAMPLES:

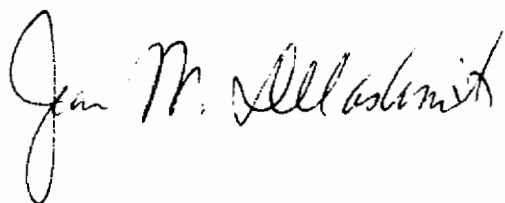
Client	Lab		Semi-	Total	TRPH-	TRPH-
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>volatiles</u>	<u>Metals</u>	<u>DRO</u>	<u>GRO</u>
164SB00501	6777.01	Soil	X	X	X	X
164SB00502	6777.02	Soil	X	X	X	X
164SB00601	6777.03	Soil	X	X	X	X
164SB00602	6777.04	Soil	X	X	X	X
164SB00701	6777.05	Soil	X	X	X	X
164SB00702	6777.06	Soil	X	X	X	X
164SB00801	6777.07	Soil	X	X	X	X
164SB00802	6777.08	Soil	X	X	X	X
164SB00901	6777.09	Soil	X	X	X	X
164SB00902	6777.10	Soil	X	X	X	X
164SB00501MS	6777.01MS	Soil	+	+	+	+
164SB00501MD	6777.01MD	Soil		+		
164SB00501MSD	6777.01MSD	Soil	+		+	+

+ = Non-billable QC analysis

MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large initial "J" and a distinct "M".

Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6777 CLP Organics and Inorganics

SAMPLES: 164SB00501, 164SB00502, 164SB00601, 164SB00602, 164SB00701, 164SB00702, 164SB00801, 164SB00802, 164SB00901, 164SB00902, 164SB00501MS, 164SB00501MD, 164SB00501MSD

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 38.8% for 2,4-dinitrophenol for the standards analyzed on 12/09/96 on instrument HP1, which exceeded the 30% QC limit. Since there were no positive results for this compound in the associated samples, no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/10/96 at 16:57 on instrument HP1 for the following compounds:

benzyl alcohol	55.9%
3,3'-dichlorobenzidine	49.8%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 164SB00702, 164SB00801, 164SB00802, 164SB00901 and 164SB00902.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) for spiked samples 164SB00601MS and 164SB00501MSD exceeded their respective QC limits for the following compounds:

<u>Compound</u>	<u>RPD</u>	<u>QC Limit</u>
phenol	52%	35%
2-chlorophenol	51%	50%
1,4-dichlorobenzene	83%	27%
n-nitroso-di-n-propylamine	55%	38%
1,2,4-trichlorobenzene	58%	23%

The results for these compounds in unspiked sample 164SB00501, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recoveries (%R's) for spiked sample 164SB00501MSD were below their respective QC limits for the following compounds:

<u>Compound</u>	<u>%R</u>	<u>QC Limits</u>
1,4-dichlorobenzene	17%	28-104%
n-nitroso-di-n-propylamine	30%	41-126%
1,2,4-trichlorobenzene	26%	38-107%
pentachlorophenol	14%	17-109%

The results for these compounds in associated unspiked sample 164SB00501, which consisted entirely of non-detects, were flagged as estimated (UJ).

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB3	aluminum	40.4 ug/L	40.4 mg/kg
PBS	barium	0.09 mg/kg	0.45 mg/kg
PBS	calcium	8.99 mg/kg	44.9 mg/kg
CCB1	magnesium	6.40 ug/L	6.40 mg/kg
CCB2	zinc	5.50 ug/L	5.50 mg/kg

CCB = Continuing Calibration Blank, PBS= Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amounts (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were

flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB1	chromium	-1.60 ug/L	1.60 mg/kg
CCB2	copper	-1.10 ug/L	1.10 mg/kg
PBS	iron	-2.56 mg/kg	12.8 mg/kg
CCB1	nickel	-1.20 ug/L	1.20 mg/kg
CCB2	potassium	-91.4 ug/L	91.4 mg/kg
CCB3	sodium	-13.3 ug/L	13.3 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	2 ug/L
arsenic	2 ug/L
manganese	10 ug/L
selenium	4 ug/L
thallium	7 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-3 ug/L
cadmium	-1 ug/L
chromium	-9 ug/L
cobalt	-4 ug/L
copper	-8 ug/L
lead	-2 ug/L
nickel	-10 ug/L
silver	-4 ug/L
sodium	-244 ug/L
vanadium	-2 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) for chromium was 10.7%, which exceeded the 10% QC limit. All positive results for this analyte in the associated soil samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The Percent Recovery (%R) of antimony in the soil LCS was 62.3%, which was below the 80-120% QC limits. All positive and non-detect results for this analyte in the soil samples in this SDG were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was required.

VIII.) Matrix Spike Recoveries:

The Percent Recovery (%R) of antimony was 58.7% for spiked sample 164SB00501MS, which was below the 75-125% QC limits. All results for this analyte in the associated samples were previously flagged based on a low LCS recovery, so no further action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS
(TRPH-DRO)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples identified in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS
(TRPH-GRO)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD analyses criteria were met. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

LIDATA

anical Services, Inc.

O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBERS: 0187 (SDG 6789.1)
0189 (SDG 6789)
CONTRACTED LAB: CEIMIC
QA/QC LEVELS: EPA Level III / Level IV
EPA METHOD: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994*
SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's,
Organophosphorus Pesticides, Chlorinated Herbicides,
Diesel Range Organics (TPH-DRO), Gasoline Range Organics
(TPH-GRO), Total Metals, Cyanide, Hexavalent Chromium
(HexaCr)
SDG NUMBERS: 6789.1 (Appendix IX, Level IV)
6789 (Level III)

SAMPLES:

SDG 6789.1 (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Organophos.
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Pesticides</u>
163CB00501*	6789-10	Soil	X	X	X	X

Client	Lab		Chlorinated	Total		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Metals</u>	<u>Cyanide</u>	<u>HexaCr</u>
163CB00501*	6789-10	Soil	X	X	X	X

* = Corresponding sample 163SB00501 was analyzed in SDG 6797.

CB = FIELD DUPLICATE

SDG 6789 (Level III):

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi- volatiles</u>	<u>Pesticides/ PCB's</u>	<u>TPH-DRO</u>
163SB00101	6789-01	Soil	X	X	X	
163SB00101RE	6789-01RE	Soil	+	+		
163SB00102	6789-02	Soil	X	X	X	
163SB00201	6789-03	Soil	X	X	X	
163SB00201RE	6789-03RE	Soil	+			
163SB00202	6789-04	Soil	X	X	X	
163SB00301	6789-05	Soil	+	+	X	
163SB00301RE	6789-05RE	Soil	X	X		
163SB00301DL	6789-05DL	Soil	+			
163SB00302	6789-06	Soil	X	+	X	
163SB00302RE	6789-06RE	Soil		X		
163SB00401	6789-07	Soil	X	X	X	
163SB00401RE	6789-07RE	Soil	+			
163SB00402	6789-08	Soil	X	X	X	
163SB00501*	6789-09	Soil	X	X	X	
163SB00501RE	6789-09RE	Soil	+			
163SB00502	6789-11	Soil	X	X	X	
163DB00201	6789-14	Water	X	X	X	X
163EB00201	6789-13	Water	X	X	X	X
163TB00201	6789-15	Water	X			X
163TB00502	6789-12	Soil	X			
163SB00102MS	6789-02MS	Soil	+	+	+	
163SB00102MSD	6789-02MSD	Soil	+	+	+	

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>TPH-GRO</u>	<u>Total Metals</u>	<u>Cyanide</u>
163SB00101	6789-01	Soil		X	X
163SB00102	6789-02	Soil		X	X
163SB00201	6789-03	Soil		X	X
163SB00202	6789-04	Soil		X	X
163SB00301	6789-05	Soil		X	X
163SB00302	6789-06	Soil		X	X
163SB00401	6789-07	Soil		X	X
163SB00402	6789-08	Soil		X	X
163SB00501*	6789-09	Soil		X	X
163SB00502	6789-11	Soil		X	X
163DB00201	6789-14	Water	X	X	X
163EB00201	6789-13	Water	X	X	X
163TB00201	6789-15	Water	X	X	X
163SB00102MD	6789-02D	Soil		+	+
163SB00102MS	6789-02S	Soil		+	+
163SB00201MD	6789-03D	Soil			+
163SB00201MS	6789-03S	Soil			+

* = Duplicate sample 163CB00501 was analyzed in SDG 6797.1.

DB = DEIONIZED WATER BLANK, DL = DILUTION, EB = EQUIPMENT RINSATE BLANK,
MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, TB = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large, looping initial "J".

Data Qualifier Definitions

- | | | |
|----|---|---|
| J | - | The association numerical value is an estimated quantity. |
| R | - | The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification. |
| U | - | The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit. |
| UJ | - | The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity. |

DATA QUALIFICATION SUMMARY

CEIMIC - 6789.1 Appendix IX, CLP Organics and Inorganics

SAMPLE: 163CB00501

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRFs) for propionitrile (0.020), acetonitrile (0.027) and 1,4-dioxane (0.017) were below the 0.050 QC limit for the initial calibration analyzed on 12/9/96 on instrument HP6. The non-detect results for these compounds in sample 163CB00501 were rejected (R).

The Percent Relative Standard Deviation (%RSD) for acetone was 36.1%, which exceeded the 30% QC limit for the initial calibration analyzed on 12/9/96 on instrument HP6. Acetone was not detected (after blank qualification) in sample 163CB00501. No action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Deionized Water Blank:

There were no positive detections in deionized water blank 163DB00201, which was analyzed in SDG 6789. No action was taken.

Equipment Rinsate Blank:

Acetone was detected in equipment rinsate blank 163EB00201, which was analyzed in SDG 6789. The positive detection of acetone in sample 163CB00501, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL.

Trip Blanks:

There were no positive detections in trip blanks 163TB00201 and 163TB00502, which were analyzed in SDG 6789. No action was taken.

TIC's:

Carbon dioxide was detected in both the method and equipment rinsate blanks in sufficient concentrations (using the 5X rule) to qualify the positive result for this compound in sample 163CB00501 as undetected (U).

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the duplicate sample pair associated with this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Blank Section IV for qualifications.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in sample 163CB00501 because of low RRF's in the initial calibration. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.029) and kepone (0.048) for the standards analyzed on 12/15/96 on instrument HP1 were below the 0.050 QC limit. The non-detect results for these two compounds in sample 163CB00501 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/15/96 on instrument HP1 for the following compounds:

1-naphthylamine	41.4%
diallate	46.7%
methapyrilene	55.7%
3,3'-dimethylbenzidine	78.1%
kepone	55.3%
famphur	37.0%
hexachlorophene	33.9%

The non-detect result for kepone was previously rejected because of a low RRF in this calibration. There were no positive detections of the other compounds in the SDG samples. No further action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for isosafrole and aramite were 0.032 and 0.045, respectively, for the standard analyzed on 12/17/96 at 13:17 on instrument HP1, which were below the 0.050 QC limit. The non-detect result for kepone was previously rejected in sample 163CB00501 because of a low RRF in the initial calibration. The non-detect result for aramite in this sample was rejected (R). No further action was taken.

The Percent Differences (%D's) exceeded the 30% QC limit for the standard analyzed on 12/17/96 at 13:17 on instrument HP1 for the following compounds:

1-naphthylamine	27.2%
2-naphthylamine	29.6%
diallate	31.7%
phorate	27.8%
sulfotep	30.3%
3,3'-dimethylbenzidine	149%
kepone	100%
famphur	27.3%
3,3'-dichlorobenzidine	43.1%
hexachlorophene	36.6%

The non-detect result for kepone was previously rejected because of a low RRF in the initial calibration. All results for the other compounds in sample 163CB00501, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

Phenol was detected at 10 ug/L and 17 ug/L, respectively, in deionized water blank 163DB00201 and equipment rinsate blank 163EB00201. Phenol was not detected in sample 163CB00501. No action was necessary.

TIC's:

4-Hydroxy-4-methyl-2-pentanone was detected in the method and 2 field blanks in sufficient concentrations (using the 5X rule) to qualify the positive result for this compound in sample 163CB00501 as undetected.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was taken.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Section IV for blank qualifications.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for kepone, aramite and isosafrole were rejected in the SDG sample because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in deionized water blank 163DB00201 and equipment rinsate blank 163EB00201, which were analyzed in SDG 6789. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate sample pair in this SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup data was not present in the data package. No action was taken.

XI.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this SDG, so no action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the sample and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB1	aluminum	10.3 ug/L	10.3 mg/kg
DB	barium	0.27 ug/L	0.27 mg/kg
ICB	beryllium	0.20 ug/L	0.20 mg/kg
DB	cadmium	0.22 ug/L	0.22 mg/kg
DB	copper	3.80 ug/L	3.80 mg/kg
DB	iron	12.9 ug/L	12.9 mg/kg
CCB5	magnesium	9.40 ug/L	9.40 mg/kg
ICB	potassium	41.4 ug/L	41.4 mg/kg
CCB3	silver	3.80 ug/L	3.80 mg/kg
ICB	sodium	6.20 ug/L	6.20 mg/kg
EB	zinc	6.70 ug/L	6.70 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
DB = Deionized Water Blank 163DB00201 (analyzed in SDG 6789),
EB = Equipment Rinsate Blank 163EB00201 (analyzed in SDG 6789)

All results, after correction for percent solids, greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration, deionized water or equipment rinsate blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	aluminum	-15.8 ug/L	15.8 mg/kg
CCB4	antimony	-1.90 ug/L	1.90 mg/kg
CCB4	arsenic	-2.20 ug/L	2.20 mg/kg
CCB4	beryllium	-0.20 ug/L	0.20 mg/kg
CCB5	chromium	-1.90 ug/L	1.90 mg/kg
CCB2	cobalt	-0.90 ug/L	0.90 mg/kg
ICB	mercury	-0.10 ug/L	0.10 mg/kg

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB5	nickel	-1.90 ug/L	1.90 mg/kg
CCB3	potassium	-46.3 ug/L	46.3 mg/kg
CCB5	silver	-1.40 ug/L	1.40 mg/kg
CCB5	sodium	-5.60 ug/L	5.60 mg/kg
PBS	thallium	-0.68 mg/kg	3.40 mg/kg
CCB3	zinc	-1.20 ug/L	1.20 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBS = Preparation Blank (Soil)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	4 ug/L
cadmium	1 ug/L
lead	4 ug/L
manganese	6 ug/L
potassium	87 ug/L
selenium	3 ug/L
thallium	6 ug/L
tin	56 ug/L
zinc	1 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-5 ug/L
chromium	-6 ug/L
cobalt	-6 ug/L
copper	-7 ug/L
nickel	-9 ug/L
silver	-6 ug/L
sodium	-158 ug/L
vanadium	-1 ug/L
zinc	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D's) of zinc was 362% in soil dilution sample 163CB00501L, which exceeded the 10% QC limit. The positive result for iron in sample 163CB00501 was flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples were analyzed. Sample 163CB00501 was analyzed in this SDG and corresponding sample 163SB00501 was analyzed in SDG 6789. The calculable Relative Percent Differences (RPD's) were:

Analyte	163CB00501, mg/kg	163SB00501, mg/kg	RPD, %
aluminum	8280	8620	4.0
chromium	6.7	8.0	17.7
lead	5.2	11.9	78.4
manganese	7.5	19.2	87.6
zinc	7.4	13.9	61.0

The RPD's for lead, manganese and zinc exceeded the 60% QC limit for soil samples. The positive detections of these three analytes in the two samples were flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Method Blank:

Cyanide was not detected in the method blank, so no action was required.

Deionized Water and Equipment Rinsate Blanks:

Cyanide was not detected in deionized water blank 163DB00201 and equipment rinsate blank 163EB00201, which were analyzed in SDG 6789. No action was taken.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate analysis was not performed in this fraction of the SDG. No action was taken.

VI.) Matrix Spike Recovery (MS):

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for the field duplicate sample pair analyzed in this SDG was not calculable. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding time from sampling date to analysis was 17 days for soil sample 163CB00501, which exceeded the 24-hour QC limit. The non-detect result for hexavalent chromium in this sample was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Hexavalent chromium was not detected in the method blank, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate analysis was not performed in this SDG. No action was necessary.

VI.) Matrix Spike Recovery (MS):

MS samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

The laboratory data were acceptable with qualification for holding time exceedance.

DATA QUALIFICATION SUMMARY

CEIMIC - 6797 CLP Organics and Inorganics

SAMPLES: 163SB00101, 163SB00101RE, 163SB00102, 163SB00201, 163SB00201RE, 163SB00202, 163SB00301, 163SB00301RE, 163SB00301DL, 163SB00302, 163SB00302RE, 163SB00401, 163SB00401RE, 163SB00402, 163SB00501, 163SB00501RE, 163SB00502, 163DB00201, 163EB00201, 163TB00201, 163TB00502, 163SB00102MD, 163SB00102MS, 163SB00102MSD, 163SB00201MD, 163SB00201MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/4/96 at 15:20 on instrument HP4 for the following compounds:

acetone	56.4%
2-butanone	57.8%
2-hexanone	40.0%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 163SB00201, 163SB00202, 163SB00301RE, 163SB00401 and 163SB00502.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/6/96 at 21:31 on instrument HP4 for the following compounds:

acetone	66.3%
2-butanone	60.8%
2-hexanone	50.2%

Since the only associated sample was a trip blank, no action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in deionized water blank 163DB00201. Acetone was detected at 2 ug/L in equipment rinsate blank 163EB00201. Acetone was not detected in the associated samples. No action was necessary.

Trip Blanks:

There were no positive detections in the two trip blanks analyzed in this SDG. No action was taken.

TIC's:

There were no TIC's detected in the SDG samples. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of ISTD chlorobenzene-d5 were both 24% in samples 163SB00301RE and 163SB00401, which were below the 50-200% QC limits. All positive detections for compounds quantitated on this ISTD in the two samples were flagged as estimated (J) and all non-detects were

rejected (R).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentration of tetrachloroethene in sample 163SB00301RE exceeded the standard calibration range. The result for this compound in the original sample was replaced with the positive result from dilution sample 163SB00301DL with appropriate flags.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 163SB00101, 163SB00201, 163SB00401 and 163SB00501 were considered by the validator to be of preferable data quality as compared to the reanalyses because of better holding times and ISTD performances. The reanalysis sample 163SB00301RE was considered by the validator to be of preferable data quality as compared to the original analysis because of improved Surrogate Recoveries and ISTD performance.

All non-detect results for compounds quantitated on ISTD chlorobenzene-d5 in samples 163SB00301RE and 163SB00401 were rejected because of very low percent recoveries. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of 2,4-dinitrophenol (38.8%) exceeded the 30% QC

limit for the standards analyzed on 12/9/97 on instrument HP1. There were no positive results for this compound in the associated samples. No action was necessary.

The Percent Relative Standard Deviations (%RSD's) of 2,4-dinitrophenol (62.0%) and 2-methyl-4,6-dinitrophenol (45.3%) exceeded the 30% QC limit for the standards analyzed on 12/23/96 on instrument HP1. There were no positive results for these two compounds in the associated samples. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/12/96 at 15:47 on instrument HP1 for the following compounds:

bis(2-chloroethoxy)methane	53.2%
hexachlorocyclopentadiene	66.1%
3-nitroaniline	27.5%
4-nitrophenol	31.2%
3,3'-dichlorobenzidine	46.8%
chrysene	28.1%

All positive and non-detect results for these compounds in the associated samples were flagged as estimated (J) and (UJ). The associated samples were 163SB00101, 163SB00102, 163SB00201 and 163SB00202.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/19/96 at 15:23 on instrument HP1 for the following compounds:

hexachlorocyclopentadiene	49.6%
3,3'-dichlorobenzidine	34.9%

The non-detect results for these two compounds in the associated samples were flagged as estimated (UJ). The associated samples were 163SB00401, 163SB00402, 163SB00501 and 163SB00502.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks, no action was required.

Deionized Water and Equipment Rinsate Blanks:

Phenol was detected at 10 ug/L and 17 ug/L, respectively, in deionized water blank 163DB00201 and equipment rinsate blank 163EB00201. The positive results for phenol in the associated samples exceeded 5X the blank amounts, so no action was taken.

TIC's:

4-Hydroxy-4-methyl-2-pentanone was detected in both field blanks in sufficient concentrations (using

the 5X rule) to qualify the positive results for this compound in all associated SDG samples undetected (U).

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Sample (LCS):

Three LCS's were analyzed in this SDG. One Percent Recovery (%R) exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for acenaphthene was 41% for spiked samples 163SB00102MS and 163SB00102MSD, which exceeded the 19% QC limit. The non-detect result for this compound in unspiked sample 163SB00102 was flagged as estimated (UJ).

VIII.) Field Duplicates:

There was no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recovery (%R) of ISTD phenanthrene-d10 was 23% in sample 163SB00101, which was below the 50-200% QC limits. All positive results for compounds quantitated on this ISTD in the sample were flagged as estimated (J) and non-detects were rejected (R).

The Percent Recovery (%R) of ISTD perylene-d12 was 23% in sample 163SB00301RE, which was below the 50-200% QC limits. All results for compounds quantitated using this ISTD in the sample, which consisted entirely of non-detects, were rejected (R).

The Percent Recoveries (%R's) of ISTD's phenanthrene-d10 (22%) and chrysene-d12 (20%) in sample 163SB00302RE were below the 50-200% QC limits. All results for compounds quantitated on these two ISTD's in the sample, which consisted entirely of non-detects, were rejected (R). In addition, the Percent Recovery (%R) of ISTD perylene-d12 was 25% in this sample, which was below the 50-200% QC limits. All results for compounds quantitated using this ISTD in the sample, which consisted entirely of non-detects, were rejected (R).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary. See Section IV for blank qualifications.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 163SB00101 was considered by the validator to be of preferable data quality as compared to the reanalysis because of better surrogate and ISTD performances. The reanalyses of samples 163SB00301 and 163SB00302 were considered by the validator to be of preferable data quality as compared to the original analyses because of improved ISTD performances.

All non-detect results for compounds quantitated on ISTD phenanthrene-d10 in samples 163SB00101 and 163SB00302RE were rejected because of very low area count %R's. All non-detect results for compounds quantitated on ISTD perylene-d12 in samples 163SB00301RE and 163SB00302RE were rejected because of very low area count %R's. All non-detect results for compounds quantitated on ISTD chrysene-d12 in sample 163SB00302RE were rejected because of very low area count %R's. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

The Relative Percent Differences (RPD's) in the field duplicate sample pair in this fraction were not calculable. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup data was not present in the data package. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance.

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

Diesel was entered on the spreadsheets as undetected (U) for equipment rinsate blank 163EB00201. The laboratory data indicated diesel was detected at 0.63 mg/L in this sample. This error was corrected on the spreadsheets during the validation process. All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Four LCS's were analyzed by the laboratory. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBS	aluminum	3.35 mg/kg	16.8 mg/kg
DB	barium	0.27 ug/L	0.27 mg/kg
ICB	beryllium	0.20 ug/L	0.20 mg/kg
DB	cadmium	0.22 ug/L	0.22 mg/kg
PBS	calcium	9.35 mg/kg	46.8 mg/kg
DB	copper	3.80 ug/L	3.80 mg/kg
DB	iron	12.9 ug/L	12.9 mg/kg
CCB1	magnesium	5.20 ug/L	5.20 mg/kg
ICB	potassium	41.4 ug/L	41.4 mg/kg
CCB3	silver	3.80 ug/L	3.80 mg/kg
PBS	sodium	3.52 mg/kg	17.6 mg/kg
PBS	zinc	2.21 mg/kg	11.1 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
 PBS = Preparation Blank (Soil), DB = Deionized Water Blank (163DB00201)

All results, after correction for percent solids, greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration, preparation or deionized water blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
PBS	aluminum	-9.11 mg/kg	45.6 mg/kg
PBS	antimony	-1.89 mg/kg	9.45 mg/kg
CCB4	arsenic	-2.20 ug/L	2.20 mg/kg
CCB4	beryllium	-0.20 ug/L	0.20 mg/kg
CCB4	chromium	-1.30 ug/L	1.30 mg/kg
CCB2	cobalt	-0.90 ug/L	0.90 mg/kg
CCB2	copper	-1.30 ug/L	1.30 mg/kg
CCB4	nickel	-1.20 ug/L	1.20 mg/kg
CCB3	potassium	-46.3 ug/L	46.3 mg/kg
CCB4	silver	-1.10 ug/L	1.10 mg/kg
CCB3	thallium	-4.60 ug/L	4.60 mg/kg
CCB3	zinc	-1.20 ug/L	1.20 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	4 ug/L
cadmium	1 ug/L
lead	4 ug/L
manganese	6 ug/L
potassium	87 ug/L
selenium	3 ug/L
thallium	3 ug/L
tin	286 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations above the IDL:

barium	-5 ug/L
chromium	-5 ug/L
cobalt	-6 ug/L
copper	-7 ug/L
nickel	-9 ug/L
silver	-5 ug/L
sodium	-158 ug/L
vanadium	-1 ug/L
zinc	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences for chromium and lead were 38% and 101%, respectively, in laboratory duplicate samples 163SB00102 and 163SB00102MD, which exceeded the 35% QC limit for soil samples. All positive and non-detect results for these two analytes in the SDG samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (R's) of antimony and iron were 72% and 239%, respectively, spiked sample

163SB00102MS, which were outside the 75-125% QC limits. All positive and non-detect results for antimony were flagged as estimated (J) and (UJ) and all positive results for iron were flagged as estimated (J) in the SDG samples.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed. Sample 163SB00501 was analyzed in this SDG and duplicate sample 163CB00501 was analyzed in SDG 6789.1. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>163CB00501, mg/kg</u>	<u>163SB00501, mg/kg</u>	<u>RPD, %</u>
aluminum	8280	8620	4.0
chromium	6.7	8.0	17.7
lead	5.2	11.9	78.4
manganese	7.5	19.2	87.6
zinc	7.4	13.9	61.0

The RPD's for lead, manganese and zinc exceeded the 60% QC limit for soil samples. The positive detections of these three analytes in the two samples were flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Method Blanks:

There was no positive detection in the method blanks, so no action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was taken.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met. No action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for cyanide in the field duplicate sample pair analyzed in this fraction of the SDG was not calculable. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

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(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0188
CONTRACTED LAB: CEIMIC
QA/QC LEVELS: EPA Level III / Level IV
EPA METHOD: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994
SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Explosives, Diesel Range Organics (TPH-DRO), Gasoline Range Organics (TPH-GRO), Total Metals, Cyanide, Hexavalent Chromium (HexaCr), Nitrate-Nitrogen, Sulfide
SDG NUMBERS: 6797.1 (Appendix IX, Level IV)
6797 (Level III)

SAMPLES:

SDG 6797.1 (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Organophos. Pesticides
698CB00201*	6797-09	Soil	X	X	X	X
698CB00201DL	6797-09DL	Soil			+	
GDK5000201	6797-01	Soil	X	X	X	X
GDK6000201	6797-02	Soil	X	X	X	X
GDKP000201	6797-03	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorinated Herbicides	Explosives	TPH- DRO	TPH- GRO	Total Metals
698CB00201*	6797-09	Soil	X		X	X	X
GDK5000201	6797-01	Soil	X	X	X	X	X

Client	Lab		Chlorinated		TPH-	TPH-	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Explosives</u>	<u>DRO</u>	<u>GRO</u>	<u>Metals</u>
GDK6000201	6797-02	Soil	X	X	X	X	X
GDKP000201	6797-03	Water	X	X	X	X	X
GDK6000201MS	6797-02MS	Soil				+	
GDK6000201MSD	6797-02MSD	Soil				+	
GDKP000201MS	6797-03MS	Water				+	
GDKP000201MSD	6797-03MSD	Water				+	

Client	Lab				Nitrate-	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Cyanide</u>	<u>HexaCr</u>	<u>Nitrite</u>	<u>Sulfide</u>
698CB00201	6797-09	Soil	X	X	X	X
GDK5000201	6797-01	Soil	X	X	X	X
GDK60000201	6797-02	Soil	X	X	X	X
GDKP000201	6797-03	Water	X	X	X	X
GDK6000201MD	6797-02MD	Soil			+	+
GDK6000201MS	6797-02MS	Soil	+		+	+
GDKP000201MD	6797-03MD	Water		+	+	+
GDKP000201MS	6797-03MS	Water	+	+	+	+

* = Duplicate sample 698SB00201 was analyzed for volatile organics, semivolatiles and total metals in SDG 6797.

Matrix Codes: 5 = BENTONITE BLANK, 6 = SAND BLANK, C = FIELD DUPLICATE,
P = POTABLE WATER BLANK

Suffix Codes: DL = DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE

SDG 6797 (Level III):

Client	Lab		Volatile	Semi-	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>Metals</u>
698SB00101	6797-05	Soil	X	X	X
698SB00101RE	6797-05RE	Soil	+		
698SB00101DL	6797-05DL	Soil		+	
698SB00102	6797-06	Soil	X	X	X
698SB00102RE	6797-06RE	Soil	+		
698SB00201*	6797-07	Soil	X	X	X
698SB00202	6797-08	Soil	X	X	X
698SB00301	6797-10	Soil	X	X	X
698SB00302	6797-11	Soil	X	X	X
698SB00401	6797-12	Soil	X	X	X
698SB00402	6797-13	Soil	X	X	X
698SB00501	6797-14	Soil	X	X	X
698SB00502	6797-15	Soil	X	X	X
698SB00601	6797-16	Soil	+	X	X
698SB00601RE	6797-16RE	Soil	X		
698SB00602	6797-17	Soil	X	X	X

Client	Lab		Volatile	Semi-	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>Metals</u>
698SB00701	6797-18	Soil	X	X	X
698SB00702	6797-19	Soil	X	X	X
698SB00801	6797-20	Soil	X	X	X
698SB00802	6797-21	Soil	X	X	X
698TB00201	6797-22	Soil	X		
GDKT000201	6797-04	Water	X		

* = Duplicate sample 698CB00201 was analyzed for volatile organics, semivolatiles and total metals in SDG 6797.1.

DL = DILUTION, RE = REANALYSIS, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC - 6797.1 Appendix IX, CLP Organics and Inorganics

SAMPLES: 698CB00201, 698CB00201DL, GDK5000201, GDK6000201, GDKP000201,
GDK6000201MS, GDK6000201MSD, GDKP000201MS, GDKP000201MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for propionitrile (0.007), acetonitrile (0.011), isobutyl alcohol (0.029), and 1,4-dioxane (0.013) were below the 0.050 QC limit for the water initial calibration analyzed on 12/9/96 on instrument HP2. The non-detect results for these compounds in associated potable water blank GDKP000201 were rejected (R).

The Percent Relative Standard Deviation (%RSD) for acetone was 31.4%, which exceeded the 30% QC limit for the initial calibration analyzed on 12/9/96 on instrument HP2. The only associated sample was potable water blank GDKP000201, so no action was required.

The average Relative Response Factors (RRF's) for propionitrile (0.020), acetonitrile (0.027) and 1,4-dioxane (0.017) were below the 0.050 QC limit for the initial calibration analyzed on 12/9/96 on instrument HP6. The non-detect results for these compounds in associated sample 698CB00201 and blanks GDK5000201 and GDK6000201 were rejected (R).

The Percent Relative Standard Deviation (%RSD) for acetone was 36.1%, which exceeded the 30% QC limit for the initial calibration analyzed on 12/9/96 on instrument HP6. The only associated positive detections of this compound were in blanks GDKP500201 and GDK6000201. No action was taken.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Trip Blank:

There were no positive detections in trip blanks 698TB00201 and GDKT000201, which were analyzed in SDG 6797. No action was taken.

TIC's:

Carbon dioxide was detected in both the water and soil method blanks in sufficient concentrations (using the 5X rule) to qualify the positive result for this compound in the associated sample as undetected (U).

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the duplicate sample pair associated with this SDG. No action was necessary.

VIII.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Section IV for blank qualifications.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile, 1,4-dioxane and isobutyl alcohol were rejected in potable water blank GDKP000201 because of low RRF's in the initial calibration. The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in the soil sample and blanks due to low RRF's in the initial calibration. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.029) and kepone (0.048) in the standards analyzed on 12/15/96 on instrument HP1 were below the 0.050 QC limit. The non-detect results for these two compounds in the SDG sample and blanks were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/15/96 on instrument HP1 for the following compounds:

1-naphthylamine	41.4%
diallate	46.7%
methapyrilene	55.7%
3,3'-dimethylbenzidine	78.1%
kepone	55.3%
famphur	37.0%
hexachlorophene	33.9%

The non-detect results for kepone were previously rejected because of a low RRF in this calibration. There were no positive detections of the other compounds in the SDG sample. No further action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for isosafrole was 0.029 for the standard analyzed on 12/18/96 at 09:27 on instrument HP1, which was below the 0.050 QC limit. The non-detect results for this compound in the SDG soil sample and blanks were previously rejected because of a low RRF in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 30% QC limit for the standard analyzed on 12/18/96 at 09:27 on instrument HP1 for the following compounds:

1-naphthylamine	46.5%
diallate	29.9%
phorate	26.9%
sulfotep	32.2%
phenacetin	30.3%
disulfoton	26.1%
parathion	31.9%
di-n-butylphthalate	25.8%
3,3'-dimethylbenzidine	144%
kepone	61.6%
famphur	49.0%
3,3'-dichlorobenzidine	41.0%

The non-detect results for kepone were previously rejected because of a low RRF in the initial calibration. All results for other compounds in soil sample 698CB00201, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Phenol was detected at 7 ug/L in water method blank EBW1209. The only associated positive detection of phenol was in potable water blank GDKP000201. No action was required.

Phenol was detected at 190 ug/kg in soil method blank EBS1210. The positive detection of phenol in associated soil sample 698CB00201, which was less than 5X the blank amount, was flagged as undetected (U) with analytical result below the CRQL being raised to the CRQL.

TIC's:

4-Hydroxy-4-methyl-2-pentanone was detected in the soil method blank in sufficient concentrations (using the 5X rule) to qualify the positive result for this compound in soil sample 698CB00201 undetected.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was taken.

VIII.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Section IV for blank qualifications.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for kepone and isosafrole were rejected in the SDG sample and blanks because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup data were not present in the data package. No action was taken.

X.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) of triphenylphosphate was 63% in associated potable water blank GDKP000201, which was below the 75-125% QC limits. No action was taken.

VI.) Laboratory Control Sample (LCS):

Three LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG, so no action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

There were no positive detections in the method blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

Six LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

EXPLOSIVES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All HPLC Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Four LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Four LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All criteria were met for the two MS / MSD sample pairs in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level	
			ug/L	mg/kg
CCB1	aluminum	28.8 ug/L	144	28.8
PBW	arsenic	2.22 ug/L	11.1	2.22
PBS	barium	0.10 mg/kg	0.10	0.50
ICB	beryllium	0.20 ug/L	1.00	0.20
ICB	cadmium	0.30 ug/L	1.50	0.30
PBS	calcium	15.7 mg/kg	15.7	78.5
CCB3	magnesium	12.1 ug/L	60.5	12.1
CCB1	silver	1.40 ug/L	7.00	1.40
PBS	sodium	3.17 mg/kg	3.17	15.9
ICB	vanadium	0.70 ug/L	3.50	0.70
PBS	zinc	2.30 mg/kg	2.30	11.5

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBW = Preparation Blank (Water), PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples and ug/L for water samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	ug/L	5X Conc. mg/kg
PBW	chromium	-5.68 ug/L	28.4	5.68
PBW	cobalt	-1.21 ug/L	6.05	1.21
CCB2	iron	-22.8 ug/L	114	22.8
PBW	nickel	-5.01 ug/L	25.1	5.01
CCB2	potassium	-61.3 ug/L	307	61.3

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	6 ug/L
arsenic	7 ug/L
manganese	6 ug/L
potassium	58 ug/L
selenium	2 ug/L
thallium	8 ug/L
tin	122 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-5 ug/L
chromium	-10 ug/L
cobalt	-5 ug/L
copper	-7 ug/L
nickel	-12 ug/L

silver	-5 ug/L
sodium	-159 ug/L
tin	-20 ug/L
vanadium	-1 ug/L
zinc	-20 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) of zinc was 105% in soil dilution sample GDK5000201L, which exceeded the 10% QC limit. The positive result for iron in associated soil sample 698CB00201 was flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed. Sample 698CB00201 was analyzed in this SDG and corresponding sample 698SB00201 was analyzed in SDG 6797. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>698CB00201, mg/kg</u>	<u>698SB00201, mg/kg</u>	<u>RPD, %</u>
aluminum	4550	4630	1.7
arsenic	2.2	2.7	10.4
calcium	1700	1420	17.9
chromium	4.6	3.5	27.2
copper	23.5	23.9	1.7
iron	3090	3210	0.6
lead	51.8	56.0	7.8
manganese	18.3	19.2	4.8
zinc	153	141	8.2

All RPD's were within the 60% QC limit for soil samples. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

WET CHEMISTRY ANALYSES

CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Cyanide was not detected in the method blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate analysis was not performed in this fraction of the SDG. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding times from sampling date to analyses were 16 days for soil sample 698CB00201 and blanks GDK5000201 and GDK6000201, which exceeded the 24-hour QC limit. The non-detect result for hexavalent chromium in sample 698CB00201 was flagged as estimated (UJ). No action was required for the blank results.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Hexavalent chromium was not detected in the method blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

NITRATE-NITRITE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Nitrate-nitrite was not detected in the method blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Sulfide was not detected in the method blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

CEIMIC - 6797 CLP Organics and Inorganics

SAMPLES: 698SB00101, 698SB00101RE, 698SB00101DL, 698SB00102, 698SB00102RE, 698SB00201, 698SB00202, 698SB00301, 698SB00302, 698SB00401, 698SB00402, 698SB00501, 698SB00502, 698SB00601, 698SB00601RE, 698SB00602, 698SB00701, 698SB00702, 698SB00801, 698SB00802, 698TB00201, GDKT000201

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/5/96 at 09:22 on instrument HP4 for the following compounds:

acetone	60.4%
2-chloroethyl vinyl ether	32.4%
2-butanone	49.0%
2-hexanone	28.9%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 698SB00101, 698SB00201, 698SB00202, 698SB00301, 698SB00302, 698SB00401, 698SB00402, 698SB00602 and 698SB00702.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/6/96 at 21:31 on instrument HP4 for the following compounds:

acetone	66.3%
2-butanone	60.8%
2-hexanone	50.2%

The positive result for acetone in associated sample 698SB00801 was flagged as estimated (J), and the non-detect results for 2-butanone and 2-hexnone in this sample were flagged as estimated (UJ). All results for these compounds in the other associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The other associated samples were 698SB00102, 698SB00501, 698SB00502, 698SB00701 and 698SB00802.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Trip Blanks:

There were no positive detections in the two trip blanks analyzed in this SDG. No action was taken.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of ISTD 1,4-dichlorobenzene-d4 were 23% and 21%, respectively, in samples 698SB00101 and 698SB00601, which were below the 50-200% QC limits. Since this compound was not a required surrogate by CLP protocol or the functional guidelines, no action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 698SB00101 and 698SB00102 were considered by the validator to be of preferable data quality as compared to the reanalyses because of better holding times. Reanalysis sample 698SB00601RE was considered by the validator to be of preferable data quality as compared to the original analysis because of improved Surrogate Recoveries and ISTD performance. All laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of 2,4-dinitrophenol (38.8%) exceeded the 30% QC limit for the standards analyzed on 12/9/97 on instrument HP1. There were no positive results for this compound in the associated samples. No action was necessary.

The Percent Relative Standard Deviations (%RSD's) of 2,4-dinitrophenol (71.8%) and 2-methyl-4,6-dinitrophenol (48.9%) exceeded the 30% QC limit for the standards analyzed on 1/2/97 on instrument HP1. There were no positive results for these two compounds in the associated samples. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/19/96 at 15:23 on instrument HP1 for the following compounds:

hexachlorocyclopentadiene	49.6%
3,3'-dichlorobenzidene	34.9%

The non-detect results for these two compounds in associated samples 698SB00702, 698SB00801 and 698SB00802 were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/16/96 at 14:57 on instrument HP5 for the following compounds:

pyridine	42.8%
2,2'-oxybis((1-chloropropane)	37.7%
2-nitroaniline	31.7%
3-nitroaniline	27.6%
4-nitroaniline	35.1%
2,4-dinitrophenol	38.2%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 698SB00501, 698SB00502, 698SB00601, 698SB00602 and 698SB00701.

IV.) Blanks:

There were no positive detections in the method blanks, no action was required.

TIC's:

4-Hydroxy-4-methyl-2-pentanone was detected in both soil method blanks in sufficient concentrations (using the 5X rule) to qualify all positive sample results for this compound as undetected (U).

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of nitrobenzene-d5 (230%), 2-fluorobiphenyl (205%), terphenyl-d14 (208%), phenol-d6 (166%), 2,4,6-tribromophenol (155%) and 2-chlorophenol (134%) exceeded their respective QC limits in sample 698SB00101. The positive result for phenol in this sample was flagged as estimated (J).

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary. Refer to Section IV for blank qualifications.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	aluminum	30.2 ug/L	30.2 mg/kg
ICB	barium	0.30 ug/L	0.30 mg/kg
PBS	lead	0.54 mg/kg	2.70 mg/kg
CCB4	magnesium	8.90 ug/L	8.90 mg/kg
CCB3	selenium	2.40 ug/L	2.40 mg/kg
CCB1	thallium	3.40 ug/L	3.40 mg/kg

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBS	zinc	1.89 mg/kg	9.45 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
 PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount after correction for percent moisture (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB2	beryllium	-0.30 ug/L	0.30 mg/kg
CCB3	calcium	-25.5 ug/L	25.5 mg/kg
CCB4	chromium	-3.70 ug/L	3.70 mg/kg
CCB4	cobalt	-1.70 ug/L	1.70 mg/kg
CCB1	copper	-1.30 ug/L	1.30 mg/kg
CCB3	iron	-18.9 ug/L	18.9 mg/kg
CCB3	mercury	-0.10 ug/L	0.10 mg/kg
CCB3	nickel	-3.90 ug/L	3.90 mg/kg
CCB3	potassium	-48.5 ug/L	48.5 mg/kg
CCB4	silver	-1.90 ug/L	1.90 mg/kg
CCB4	sodium	-5.50 ug/L	5.50 mg/kg

CCB = Continuing Calibration Blank

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	9 ug/L
arsenic	6 ug/L
manganese	6 ug/L
potassium	17 ug/L
selenium	4 ug/L
thallium	7 ug/L
tin	289 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no

action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations the IDL:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-8 ug/L
cobalt	-7 ug/L
copper	-9 ug/L
nickel	-11 ug/L
silver	-7 ug/L
sodium	-173 ug/L
vanadium	-3 ug/L
zinc	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed. Sample 698SB00201 was analyzed in this SDG and duplicate sample 698CB00201 was analyzed in SDG 6797.1. The calculable Relative Percent Differences (RPD's) were:

Analyte	698CB00201, mg/kg	698SB00201, mg/kg	RPD, %
aluminum	4550	4630	1.7
arsenic	2.2	2.7	10.4
calcium	1700	1420	17.9
chromium	4.6	3.5	27.2
copper	23.5	23.9	1.7
iron	3090	3210	0.6

<u>Analyte</u>	<u>698CB00201, mg/kg</u>	<u>698SB00201, mg/kg</u>	<u>RPD, %</u>
lead	51.8	56.0	7.8
manganese	18.3	19.2	4.8
zinc	153	141	8.2

All RPD's were within the 60% QC limit for soil samples. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0190
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVELS: EPA Level III / Level IV
EPA METHOD: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Soil
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Diesel Range Organics (DRO), Gasoline Range Organics (GRO), Total Metals, Cyanide, Hexavalent Chromium (HexaCr)

SDG NUMBERS: 6830.1 (Appendix IX, Level IV)
6830 (Level III)

SAMPLES:

SDG 6830.1 (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Organophos.
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Pesticides</u>
GDKCB00502*	6830-11	Soil	X	X	X	X
GDKCB00502RE	6830-11RE	Soil		+		

Client	Lab		Chlorinated	Total		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Metals</u>	<u>Cyanide</u>	<u>HexaCr</u>
GDKCB00502*	6830-11	Soil	X	X	X	X

* = Corresponding sample GDKSB00502 was analyzed in SDG 6830.

CB = FIELD DUPLICATE, RE = REANALYSIS

SDG 6830 (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	DRO
GDKSB00101	6830-01	Soil	+	X	X	X
GDKSB00101RE	6830-01RE	Soil	X			
GDKSB00102	6830-02	Soil	X	X	X	X
GDKSB00201	6830-03	Soil	X	X	X	X
GDKSB00202	6830-04	Soil	X	X	X	X
GDKSB00301	6830-05	Soil	X	X	X	X
GDKSB00301RE	6830-05RE	Soil	+			
GDKSB00302	6830-06	Soil	X	X	X	X
GDKSB00401	6830-07	Soil	+	X	X	X
GDKSB00401RE	6830-07RE	Soil	X			
GDKSB00402	6830-08	Soil	X	X	X	X
GDKSB00501	6830-09	Soil	+	X	X	X
GDKSB00501RE	6830-09RE	Soil	X			
GDKSB00502*	6830-10	Soil	X	X	X	X
GDKTB00101	6830-12	Soil	X			X
GDKSB00201MS	6830-03MS	Soil	+	+	+	+
GDKSB00201MSD	6830-03MSD	Soil	+	+	+	+

Client Sample #	Lab Sample #	Matrix	GRO	Total Metals	Cyanide
GDKSB00101	6830-01	Soil	X	X	X
GDKSB00102	6830-02	Soil	X	X	X
GDKSB00201	6830-03	Soil	X	X	X
GDKSB00202	6830-04	Soil	X	X	X
GDKSB00301	6830-05	Soil	X	X	X
GDKSB00302	6830-06	Soil	X	X	X
GDKSB00401	6830-07	Soil	X	X	X
GDKSB00402	6830-08	Soil	X	X	X
GDKSB00501	6830-09	Soil	X	X	X
GDKSB00502*	6830-10	Soil	X	X	X
GDKTB00101	6830-12	Soil	X		
GDKSB00201MS	6830-03MS	Soil	+	+	+
GDKSB00201MSD	6830-03MSD	Soil	+		
GDKSB00201MD	6830-03MD	Soil		+	+

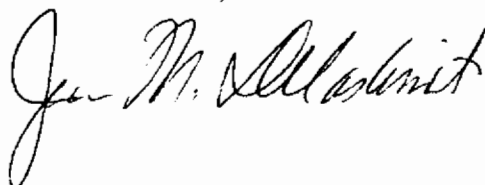
* = Corresponding sample GDKCB00502 was analyzed in SDG 6830.1.

+ = Non-billable analysis

MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, TB = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UI - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC - 6830.1 Appendix IX, CLP Organics and Inorganics

SAMPLES: GDKCB00502, GDKCB00502RE

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for propionitrile (0.020), acetonitrile (0.027) and 1,4-dioxane (0.017) were below the 0.050 QC limit for the initial calibration analyzed on 12/9/96 on instrument HP6. The non-detect results for these compounds in sample GDKCB00502 were rejected (R).

Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Trip Blank:

There were no positive detections in trip blank GDKTB00101, which was analyzed in SDG 6830. No action was taken.

TIC's:

TIC's were not detected in the method and trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the duplicate sample pair associated with this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in sample GDKCB00502 because of low RRF's in the initial calibration. The other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.027) and kepone (0.048) in the standards analyzed on 12/15/97 on instrument HP1 were below the 0.050 QC limit. The non-detect result for isosafrole and kepone in sample GDKCB00502 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/15/97 on instrument HP1 for the following compounds:

1-naphthylamine	41.4%
diallate	46.7%
methapyrilene	55.7%
3,3'-dimethylbenzidine	78.1%
kepone	55.3%
famphur	37.0%
hexachlorophene	33.9%

The non-detect result for kepone was previously rejected because of a low RRF in this calibration. There were no positive detections of the other compounds in the SDG sample. No further action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 30% QC limit for the standard analyzed on 12/18/96 at 08:27 on instrument HP1 for the following compounds:

1-naphthylamine	46.5%
diallate	29.9%
phorate	26.9%
hexachlorobenzene	32.2%
phenacetin	30.0%
phenanthrene	35.6%
disulfoton	26.1%
di-n-butylphthalate	25.8%
parathion	31.9%
3,3'-dimethylbenzidine	144%

kepone	61.6%
3,3'-dichlorobenzidine	41.0%
famphur	49.0%

The non-detect result for kepone was previously rejected because of a low RRF in the initial calibration. In addition, the non-detect results for hexachlorbenzene, phenanthrene, di-n-butylphthalate and 3,3'-dichlorobenzidine were rejected because of low internal standard recoveries. All results for the other compounds in sample GDKCB00502, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Phenol was detected at 210 ug/kg and 190 ug/kg, respectively, in method blanks EBS1210 and EBS1210A. The positive detection of phenol in associated sample GDKCB00502, which was less than 5X the blank amounts, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL.

TIC's:

4-Hydroxy-4-methyl-2-pentanone was detected in the method blanks in sufficient concentrations (using the 5X rule) to qualify the positive result for this compound in sample GDKCB00502 as undetected. Data Validation action based on TIC's detected in the blanks was not required. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

The Internal Standard Percent Recoveries (%R's) of phenanthrene-d10 (16%), chrysene-d12 (13%) and perylene-d12 (17%) were below the 50-200% QC limits for sample GDKCB00502. Since the %R's were less than 25%, all compounds quantitated using these three ISTD's, which consisted entirely of non-detects, were rejected (R). The reanalysis of this sample did not yield improved ISTD recoveries.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Section IV for blank qualifications.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample GDKCB00502 was considered by the validator to be of preferable data quality as compared to the reanalysis sample because of better ISTD %R's.

The non-detect results for kepone and isosafrole were rejected in sample GDKCB00502 because of low RRF's in the initial calibration. In addition, the non-detect results for 22 compounds quantitated using ISTD's phenanthrene-d10, chrysene-d12 and perylene-d12 were rejected because of very low area count %R's (less than 25%) in sample GDKCB00502. All remaining laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup data was not present in the data package. No action was taken.

XI.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Diesel Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) for the field duplicate sample pair analyzed in this SDG was not calculable. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS's was analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) for the field duplicate sample pair analyzed in this SDG was not calculable, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the sample and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	aluminum	37.6 ug/L	37.6 mg/kg
PBS	barium	0.09 mg/kg	0.45 mg/kg
ICB	copper	2.40 ug/L	2.40 mg/kg
CCB4	lead	1.40 ug/L	1.40 mg/kg

<u>Blank ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	magnesium	11.3 ug/L	11.3 mg/kg
CCB1	potassium	33.6 ug/L	33.6 mg/kg
PBS	zinc	2.09 mg/kg	10.5 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
 PBS = Preparation Blank (Soil)

All results, after correction for percent solids, greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
ICB	aluminum	-14.4 ug/L	14.4 mg/kg
CCB2	chromium	-2.90 ug/L	2.90 mg/kg
CCB2	cobalt	-0.90 ug/L	0.90 mg/kg
CCB2	copper	-1.80 ug/L	1.80 mg/kg
ICB	iron	-19.9 ug/L	19.9 mg/kg
PBS	manganese	-0.29 mg/kg	1.45 mg/kg
CCB2	nickel	-1.90 ug/L	1.90 mg/kg
ICB	potassium	-44.7 ug/L	44.7 mg/kg
CCB2	silver	-1.40 ug/L	1.40 mg/kg
CCB5	thallium	-4.40 ug/L	4.40 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
 PBS = Preparation Blank (Soil)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	2 ug/L
lead	3 ug/L
manganese	7 ug/L
tin	89 ug/L
zinc	8 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-7 ug/L
cobalt	-5 ug/L
copper	-4 ug/L
nickel	-10 ug/L
selenium	-3 ug/L
silver	-5 ug/L
sodium	-165 ug/L
vanadium	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) for lead (31.8%) in soil dilution sample GDKCB00502L exceeded the 10% QC limit. The positive result for lead in sample GDKCB00502 was flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) for antimony and thallium were 59.5% and 67.8%, respectively, which were below the 80-120% QC limits. The non-detect results for these two analytes in sample GDKCB00502 were flagged as estimated (UJ).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Sample GDKCB00502 was analyzed in this SDG and corresponding sample GDKSB00502 was analyzed in SDG 6830. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDKCB00502, mg/kg	GDKSB00502, mg/kg	RPD, %
aluminum	6850	5780	16.9
chromium	6.0	5.3	12.4
iron	4790	4960	3.5
lead	3.5	3.5	0
manganese	5.9	5.0	16.5

All RPD's were within the 60% QC limit for soil samples. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding time from sampling date to analysis was 14 days for soil sample GDKCB00502, which exceeded the 24-hour QC limit. The non-detect result for hexavalent chromium in this sample was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

There was no positive detection in the method blank, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate analysis was not performed in this SDG. No action was necessary.

VI.) Matrix Spike Recovery (MS):

MS samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

The laboratory data were acceptable with qualification.

DATA QUALIFICATION SUMMARY

CEIMIC - 6830 CLP Organics and Inorganics

SAMPLES: GDKSB00101, GDKSB00101RE, GDKSB00102, GDKSB00201, GDKSB00202, GDKSB00301, GDKSB00301RE, GDKSB00302, GDKSB00401, GDKSB00401RE, GDKSB00501, GDKSB00501RE, GDKSB00502, GDKTB00101, GDKSB00201MS, GDKSB00201MSD, GDKSB00201MD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for methylene chloride was 42.5% for the standards analyzed on 12/5/96 on instrument HP4. There were no detections of this compound in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/9/96 at 10:31 on instrument HP4 for the following compounds:

methylene chloride	36.0%
2-chloroethyl vinyl ether	37.7%
vinyl acetate	25.7%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDKSB00102, GDKSB00201, GDKSB00202, GDKSB00301 and GDKSB00302.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/6/96 at 23:23 on instrument HP4 for the following compounds:

methylene chloride	34.6%
2-chloroethyl vinyl ether	33.2%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDKSB00101RE, GDKSB00401RE, GDKSB00402 and GDKSB00502.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/10/96 at 11:04 on instrument HP4 for the following compounds:

chloromethane	27.8%
acetone	31.2%
methylene chloride	33.3%
2-chloroethyl vinyl ether	40.8%

All results for these compounds in associated sample GDKSB00501RE, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Trip Blank:

There were no positive detections in trip blank GDKTB00101. No action was taken.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of ISTD's 1,4-difluorobenzene (25%) and chlorobenzene-d5 (23%) in sample GDKSB00401RE were below the 50-200% QC limits. All results for compounds quantitated using ISTD 1-4-difluorobenzene in the sample, which consisted entirely of non-detects, were flagged as estimated (UJ) and all results for compounds quantitated on ISTD chlorobenzene-d5, which consisted entirely of non-detects, were rejected (R).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was required.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was taken.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample GDKSB00301 was considered by the validator to be of preferable data quality as compared to the reanalysis because of its better holding time. The reanalyses of samples GDKSB00101, GDKSB00401 and GDKSB00501 were considered by the validator to be of preferable data quality as compared to the original analyses because of improved surrogate and internal standard performance.

All non-detect results for the nine compounds quantitated on ISTD chlorobenzene-d5 in sample GDKSB00401RE were rejected because of low area count %R's. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) of benzoic acid (50.8%) and 2,4-dinitrophenol (36.8%) exceeded the 30% QC limit for the standards analyzed on 12/23/96 on instrument HP5. These two compounds were not detected in the associated sample. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/16/96 at 14:57 on instrument HP5 for the following compounds:

2,2'-oxybis(1-chloropropane)	37.7%
2-nitroaniline	31.7%
3-nitroaniline	27.6%
4-nitroaniline	35.1%
2,4-dinitrophenol	38.2%

The non-detect results for these compounds in associated sample GDKSB00502 were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blank:

Phenol was detected at 210 ug/kg in method blank EBS1210. There were no detections of phenol in the associated samples, so no action was required.

TIC's:

4-Hydroxy-4-methyl-2-pentanone was detected in method blank EBS1210 at a sufficient concentration (using the 5X rule) to qualify the positive results for this compound in all associated SDG samples undetected (U).

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. One Percent Recovery (%R) exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of 2,4-dinitrotoluene was 91% for spiked sample GDKSB00201MSD, which exceeded the 28-89% QC limits. This compound was not detected in unspiked

sample GDKSB00201. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary. See Section IV for blank qualifications.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

The Surrogate Recovery (%R) was 225% for decachlorobiphenyl (DCB) in sample GDKSB00202 for the standards analyzed on the primary column, which exceeded the 30-150% QC limits. Since there were no detections in this sample, no action was necessary.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory in this SDG. All Recovery criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) in the field duplicate sample pair in this SDG. No action was necessary.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Difference (%D) for 4,4'-DDT was 118% for associated sample GDKSB00201, which exceeded the 70% QC limit. The positive result for this compound in the sample was flagged as estimated (J).

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup data was not present in the data package. No action was taken.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

DIESEL RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Diesel Range Organics were not detected in the method or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for the field duplicate sample pair analyzed in this SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Gasoline Range Organics were not detected in the method or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for the field duplicate sample pair analyzed in this fraction of the SDG. No action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	aluminum	37.6 ug/L	37.6 mg/kg
CCB4	barium	0.20 ug/L	0.20 mg/kg
PBS	calcium	6.27 mg/kg	31.4 mg/kg
ICB	copper	2.40 ug/L	2.40 mg/kg
CCB4	lead	1.40 ug/L	1.40 mg/kg
CCB4	magnesium	11.3 ug/L	11.3 mg/kg
CCB1	potassium	33.6 ug/L	33.6 mg/kg
PBS	sodium	1.35 mg/kg	6.75 mg/kg
PBS	zinc	3.35 mg/kg	17.8 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBS = Preparation Blank (Soil)

All results, after correction for percent solids, greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
ICB	aluminum	-14.4 ug/L	14.4 mg/kg
CCB2	chromium	-2.90 ug/L	2.90 mg/kg
CCB2	cobalt	-0.90 ug/L	0.90 mg/kg
CCB2	copper	-1.80 ug/L	1.80 mg/kg
ICB	iron	-19.9 ug/L	19.9 mg/kg
PBS	manganese	-0.29 mg/kg	1.45 mg/kg
CCB2	nickel	-1.90 ug/L	1.90 mg/kg
ICB	potassium	-44.7 ug/L	44.7 mg/kg
CCB2	silver	-1.40 ug/L	1.40 mg/kg
CCB5	thallium	-4.40 ug/L	4.40 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBS = Preparation Blank (Soil)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	2 ug/L
lead	3 ug/L
manganese	7 ug/L
tin	89 ug/L
zinc	8 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-7 ug/L
cobalt	-5 ug/L
copper	-4 ug/L
nickel	-10 ug/L
selenium	-3 ug/L
silver	-5 ug/L
sodium	-165 ug/L
tin	-45 ug/L
vanadium	-3 ug/L
zinc	-34 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) of antimony and tin were 65.1% and 72.1%, respectively,

which were below the 80-120% QC limits. The positive and non-detect results for these two analytes in the SDG samples were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was taken.

VIII.) Matrix Spike Recoveries:

All MS Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00502 was analyzed in SDG 6830.1 and corresponding sample GDKSB00502 was analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>GDKCB00502, mg/kg</u>	<u>GDKSB00502, mg/kg</u>	<u>RPD, %</u>
aluminum	6850	5780	16.9
chromium	6.0	5.3	12.4
iron	4790	4960	3.5
lead	3.5	3.5	0
manganese	5.9	5.0	16.5

All RPD's were within the 60% QC limit for soil samples. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0191
CONTRACTED LAB: CEIMIC
QA/QC LEVELS: EPA Level III / Level IV
EPA METHOD: EPA SOW 3-90
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Soil
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Gasoline Range Organics, Diesel Range Organics, Total Metals, Cyanide, Hexavalent Chromium

SDG NUMBERS: 6880.1 (Appendix IX, Level IV)
6880 (Level III)

SAMPLES:

SDG 6880.1 (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Metals</u>
GDKCB00902*	6880-09	Soil	X	X	X	X
Client	Lab		Organophos.	Gasoline Range	Diesel Range	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Pesticides</u>	<u>Organics</u>	<u>Organics</u>	
GDKCB00902*	6880-09	Soil	X	X	X	
Client	Lab		Chlorinated	Hexavalent		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicide</u>	<u>Chromium</u>		<u>Cyanide</u>
GDKCB00902*	6880-09	Soil	X	X		X

* = Corresponding sample GDKSB00902 was analyzed in SDG 6880.

CB = FIELD DUPLICATE

SDG 6880 (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals
ANXM000101	6880-11	Soil	X	X	X	X
ANXM000101RE	6880-11RE	Soil	+			
ANXM000101DL	6880-11DL	Soil			+	
GDKSB00601	6880-01	Soil	X	X	X	X
GDKSB00601RE	6880-01RE	Soil	+			
GDKSB00602	6880-02	Soil	X	X	X	X
GDKSB00701	6880-03	Soil	X	X	X	X
GDKSB00701RE	6880-03RE	Soil	+			
GDKSB00702	6880-04	Soil	X	X	X	X
GDKSB00801	6880-05	Soil	X	X	X	X
GDKSB00801RE	6880-05RE	Soil	+			
GDKSB00802	6880-06	Soil	X	X	X	X
GDKSB00901	6880-07	Soil	+	X	X	X
GDKSB00901RE	6880-07RE	Soil	X			
GDKSB00902*	6880-08	Soil	X	X	X	X
GDKTB00601	6880-10	Soil	X			

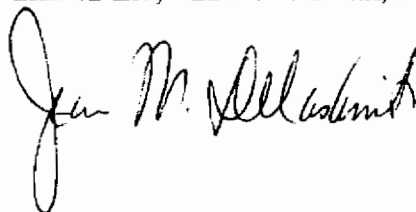
Client Sample #	Lab Sample #	Matrix	Gasoline Range Organics	Diesel Range Organics	Cyanide
ANXM000101	6880-11	Soil	X	X	X
GDKSB00601	6880-01	Soil	X	X	X
GDKSB00602	6880-02	Soil	X	X	X
GDKSB00701	6880-03	Soil	X	X	X
GDKSB00702	6880-04	Soil	X	X	X
GDKSB00801	6880-05	Soil	X	X	X
GDKSB00802	6880-06	Soil	X	X	X
GDKSB00901	6880-07	Soil	X	X	X
GDKSB00902*	6880-08	Soil	X	X	X
GDKTB00601	6880-10	Soil	X	X	
GDKSB00802MS	6880-06MS	Soil			+

* = Field duplicate sample GDKCB00902 was analyzed in SDG 6880.1.

DL = DILUTION, MS = MATRIX SPIKE, RE = REANALYSIS, TB = TRIP BLANK

DATA REVIEWER(S): Linda H. Liu, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- | | | |
|----|---|---|
| J | - | The association numerical value is an estimated quantity. |
| R | - | The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification. |
| U | - | The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit. |
| UJ | - | The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity. |

DATA QUALIFICATION SUMMARY

CEIMIC - 6880.1 Appendix IX, CLP Organics and Inorganics

SAMPLE: GDKCB00902

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Relative Response Factors (RRF's) for propionitrile (0.020), acetonitrile (0.027) and 1,4-dioxane (0.017) were below the 0.050 QC limit for the initial calibration analyzed on 12/09/96 on instrument HP6. The non-detect results for these compounds in the associated sample were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for propionitrile (0.021), acetonitrile (0.029) and 1,4-dioxane (0.016) were below the 0.050 QC limit for the continuing calibration standard analyzed on 12/12/96 at 10:39 on instrument HP6. The non-detect results for these compounds in the associated sample were previously rejected due to very low RRF's in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/12/96 at 10:39 on instrument HP6 for the following compounds:

bromomethane	71.4%
acetone	42.2%
2-butanone	43.9%
2-hexanone	44.2%
trichlorofluoromethane	26.1%

All results for these compounds in the associated sample, which consisted entirely of non-detects after blank qualification, were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

Acetone was detected at 3 ug/kg in method blank VBS1212A. The detection of acetone in the associated sample, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being replaced with the CRQL.

Trip Blanks:

There were no positive detections in the trip blank, analyzed in SDG 6880. No action was taken.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG, no action was taken.

VIII.) Field Duplicates:

Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. There were no calculable Relative Percent Differences (RPD's) for this set of field duplicate samples, so no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in the SDG sample because of low RRF's in the initial and continuing calibrations. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.030), 4-nitroquinoline-1-oxide (0.007) and aramite (0.048) in the standards analyzed on 1/11/97 on instrument HP1 were below the 0.050 QC limit. The non-detect results for these compounds in the associated soil sample were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for isosafrole (0.024), 4-nitroquinoline-1-oxide (0.011), aramite (0.046) and 3,3'-dimethylbenzidine (0.015) for the standards analyzed on 1/13/97 at 10:26 on instrument HP1 were below the 0.050 QC limit. The non-detect result for 3,3'-dimethylbenzidine in the associated soil sample was rejected (R). The non-detect results for isosafrole, aramite and 4-nitroquinoline-1-oxide in the associated soil sample were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 1/13/97 at 10:26 on instrument HP1 for the following compounds:

dimethoate	37.5%
4-nitroquinoline-1-oxide	60.1%
3,3'-dimethylbenzidine	82.5%

benzo(k)fluoranthene	27.6%
3-methylcholanthrene	33.7%

All results for dimethoate, benzo(k)fluoranthene and 3-methylcholanthrene in the associated sample, which consisted entirely of non-detects, were flagged as estimated (UJ). The non-detect results for 4-nitroquinoline-1-oxide and 3,3'-dimethylbenzidine were previously rejected because of low RRF's in the initial and continuing calibrations. No further action was taken.

IV.) Blanks:

Method Blank:

Phenol was detected at 380 ug/kg in the method blank EBS1216. The detection of phenol in the associated sample, which was less than 10X the blank amount after correction for percent solids, was flagged as undetected (U) with the detection limit being raised to the level of contamination in the sample.

Field Blanks:

There were no field blanks in this SDG, no action was required.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples, so no action was required.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for isosafrole, 4-nitroquinoline-1-oxide, aramite and 3,3'-dimethylbenzidine were rejected in the SDG sample because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. There were no calculable Relative Percent Differences (RPD's) for this set of field duplicate samples, so no action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC clean up data were not present in the data package. No action was required.

XI.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG, no action was taken.

VIII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

Herbicides Identification Summary (HIS):

All HIS Identification criteria were met. No action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

GRO was not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. The Relative Percent Difference (RPD) for GRO in the field duplicate samples was not calculable. No action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

There was no positive detection of DRO in the method blank. No action was necessary.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of bis(2-ethylhexyl)phthalate was 59.1% in sample GDKCB00902, which was below the 70-124% QC limits. The positive result for this sample was flagged as estimated (J).

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this SDG, so no action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. The Relative Percent Difference (RPD) for DRO was 19% in the field duplicate sample pair, which was within the 60% QC limit for soil samples, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the soil sample and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBS	aluminum	8.85 mg/kg	44.3 mg/kg
CCB2	antimony	1.60 ug/L	1.60 mg/kg
PBS	barium	0.15 mg/kg	0.75 mg/kg
CCB2	beryllium	0.20 ug/L	0.20 mg/kg
PBS	calcium	5.52 mg/kg	27.6 mg/kg
ICB	lead	1.20 ug/L	1.20 mg/kg
CCB	silver	4.80 ug/L	4.80 mg/kg

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBS	sodium	2.58 mg/kg	12.9 mg/kg
PBS	zinc	3.67 mg/kg	18.4 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
 PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (after correction for percent solids) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB1	calcium	-18.5 ug/L	18.5 mg/kg
CCB1	chromium	-1.40 ug/L	1.40 mg/kg
CCB1	copper	-1.00 ug/L	1.00 mg/kg
CCB2	lead	-0.80 ug/L	0.80 mg/kg
CCB4	mercury	-0.10 ug/L	0.10 mg/kg
PBS	nickel	-0.24 mg/kg	1.20 mg/kg
CCB1	silver	-1.30 ug/L	1.30 mg/kg
CCB1	sodium	-3.80 ug/L	3.80 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

V.) ICP Serial Dilution Analysis:

All criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) of antimony (58.6%) and iron (126.7%) were outside the 80-120% QC limits. The non-detect result for antimony in the associated soil sample was flagged as estimated (UJ). The positive result for iron in the associated soil sample was flagged as estimated (J).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recovery (MS):

There were no MS samples in this SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>GDKSB00902, mg/kg</u>	<u>GDKCB00902, mg/kg</u>	<u>RPD</u>
aluminum	4470	5290	17%
chromium	3.9	5.6	36%
iron	560	1030	59%
lead	2.1	3.8	58%
manganese	1.4	3.3	81%

The RPD for manganese exceeded the 60% QC limit for soil samples. The positive detection of manganese in sample GDKSB00902 was flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

Cyanide was not detected in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike Recovery (MS):

There was no matrix spike sample analyzed in this SDG. No action was taken..

VII.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. Sample GDKCB00902 was analyzed in this SDG, while corresponding sample GDKSB00902 was analyzed in SDG 6880. The Relative Percent Difference (RPD) for these field duplicate samples was not calculable, so no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding time from sample date to analysis was 24 days for the SDG soil sample, which exceeded the 24-hour QC limit. The non-detect result for the sample was flagged as estimated (UF).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. Data qualification was not necessary.

III.) Blank:

Hexavalent chromium was not detected in the method blank, no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VI.) Matrix Spike Recovery (MS):

There was no MS sample analyzed in this SDG, so no action was taken.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

DATA QUALIFICATION SUMMARY

CEIMIC - 6880, CLP Organics and Inorganics

SAMPLES: ANXM000101, ANXM000101RE, ANXM000101DL, GDKSB00601, GDKSB00601RE, GDKSB00602, GDKSB00701, GDKSB00701RE, GDKSB00702, GDKSB00801, GDKSB00801RE, GDKSB00802, GDKSB00901, GDKSB00901RE, GDKSB00902, GDKTB00601, GDKSB00802MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of acetone was 33.8% for the initial calibration analyzed on 12/10/96 on instrument HP4, which exceeded the 30% QC limit. Since there were no positive detections of this compound in the associated samples, no action was taken.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/11/96 at 21:00 on instrument HP4 for the following compounds:

acetone	35.6%
2-chloroethyl vinyl ether	37.3%
2-butanone	27.5%
2-hexanone	25.5%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks, no action was taken.

Trip Blank:

There were no positive detections in trip blank GDKTB00601. No action was taken.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of 4-bromofluorobenzene were below the 74-121% QC limits for following samples:

<u>Client Sample ID</u>	<u>4-Bromofluorobenzene, %R</u>
GDKSB00601	73%
GDKSB00801	73%
GDKSB00801RE	62%

All results for samples GDKSB00601 and GDKSB00801, which consisted entirely of non-detects, were flagged as estimated (UJ).

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG, no action was taken.

VIII.) Field Duplicates:

One set of field duplicate samples was analyzed. Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. There were no calculable Relative Percent Differences (RPD's) for this set of field duplicate samples, so no action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of internal standards were below the 50-200% QC limits for following samples:

<u>Client Sample ID</u>	<u>Chlorobenzene-d5</u>	<u>1,4-Dichlorobenzene-d4</u>
ANXM000101	-	47%
GDKSB00601	-	41%
GDKSB00701	-	49%
GDKSB00801	47%	33%
GDKSB00801RE	-	31%
GDKSB00901RE	-	47%

Since there were no compounds associated with ISTD 1,4-dichlorobenzene-d4 in the associated samples, no action was required. The results for sample GDKSB00801 were previously flagged as estimated because of a low surrogate recovery. No further action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples ANXM000101, GDKSB00601, GDKSB00701 and GDKSB00801 were considered by the validator to be of preferable data quality compared to the reanalyses because of better internal standard area counts and/or surrogate recoveries. The re-analysis sample GDKSB00901RE was considered by the validator to be of preferable data quality compared to the original analysis because of improved internal standard performance. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standard analyzed on 11/27/96 on instrument HP1 for the following compounds:

benzoic acid	50.8%
2,4-dinitrophenol	36.8%

Since these compounds were not detected in the associated samples, no action was taken.

Continuing Calibrations:

All Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blank:

Phenol (440 ug/kg), pentachlorophenol (8700 ug/kg), bis(2-ethylhexyl)phthalate (270 ug/kg) and benzo(a)pyrene (590 ug/kg) were detected in the method blank EBS1216. Since pentachlorophenol, bis(2-ethylhexyl)phthalate and benzo(a)pyrene were not detected in the associated samples, no action was taken. Detections of phenol in the associated samples less than 10X the blank amount were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. There were no calculable Relative Percent Differences (RPD's) for this set of field duplicate samples, so no action was required.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. There were no calculable Relative Percent Differences (RPD's) for this set of field duplicate samples, so no action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC clean up data was not present in the data package. No action was taken.

XI.) Overall Assessment of Data/General:

The detections of 4,4'-DDE and 4,4'-DDD exceeded the instrument's linear calibration range in sample ANXM000101. The undiluted values in the original analysis were replaced with the diluted values for these two compounds with appropriate flagging (D). All other laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

GRO was not detected in the method or trip blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG, so no action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. The Relative Percent Difference (RPD) for this set of field duplicate samples was not calculable, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

DRO was not detected in the method or trip blank. No action was necessary.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of bis(2-ethylhexyl)phthalate in sample GDKSB00601 was 126%, which exceeded the 70-124% QC limits. The detection of DRO in this sample was flagged as estimated (J).

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG, so no action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. The Relative Percent Difference (RPD) for DRO was 19% in the field duplicate samples, which was within the 60% QC limit for soil samples, so no action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the soil samples and were used for data qualification:

<u>Blank</u> <u>Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB3	aluminum	40.5 ug/L	40.5 mg/kg
CCB1	antimony	1.40 ug/L	1.40 mg/kg
PBS	barium	0.16 mg/kg	0.80 mg/kg
PBS	calcium	5.97 mg/kg	29.9 mg/kg
CCB1	magnesium	4.80 ug/L	4.80 mg/kg
CCB2	selenium	3.50 ug/L	3.50 mg/kg
PBS	sodium	2.75 mg/kg	13.8 mg/kg
PBS	zinc	3.56 mg/kg	17.8 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (after correction for percent solids) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank</u> <u>Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB3	calcium	-20.3 ug/L	20.3 mg/kg
CCB3	chromium	-1.20 ug/L	1.20 mg/kg
CCB3	copper	-1.00 ug/L	1.00 mg/kg
CCB2	lead	-1.60 ug/L	1.60 mg/kg
CCB4	nickel	-8.30 ug/L	8.30 mg/kg
CCB3	sodium	-5.70 ug/L	5.70 mg/kg
CCB3	zinc	-0.30 ug/L	0.30 mg/kg

CCB = Continuing Calibration Blank

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) of antimony (75.9%) and tin (74.8 %) were below the 80-120% QC limits. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recovery (MS):

MS samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>GDKSB00902, mg/kg</u>	<u>GDKCB00902, mg/kg</u>	<u>RPD</u>
aluminum	4470	5290	17%
chromium	3.9	5.6	36%
iron	560	1030	59%
lead	2.1	3.8	58%
manganese	1.4	3.3	81%

The RPD for manganese exceeded the 60% QC limit for soil samples. The positive detection of manganese in sample GDKSB00902 was flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

Sample GDKSB00902 was analyzed in this SDG, while duplicate sample GDKCB00902 was analyzed in SDG 6880.1. The Relative Percent Difference (RPD) for these field duplicate samples was not calculable, so no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0194
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRICES: Soil, Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 28083

SAMPLES:

SDG 28083A (Level IV):

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
161HW00101	28089.01	Water	X
162DW00201	28083.01	Water	X
162EW00201	28083.02	Water	X
693CB00101	28178.01	Soil	X

SDG 28083B (Level III):

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
693SB00101	28177.02	Soil	X
693SB00102	28177.03	Soil	X
693SB00201	28165.01	Soil	X
693SB00301	28165.02	Soil	X
693SB00401	28177.01	Soil	X

Client	Lab		PCDD/
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>PCDF</u>
694SB00101	28177.07	Soil	X
694SB00201	28177.09	Soil	X
694SB00501	28177.08	Soil	X
694SB00601	28177.06	Soil	X
694SB00701	28177.04	Soil	X
694SB00702	28177.05	Soil	X

C or H = FIELD DUPLICATE SAMPLE, D = DEIONIZED WATER BLANK,
E = EQUIPMENT RINSATE BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 28083 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 161HW00101, 162DW00201, 162EW00201, 693CB00101,
693SB00101, 693SB00102, 693SB00201, 693SB00301, 693SB00401,
694SB00101, 694SB00201, 694SB00501, 694SB00601, 694SB00701,
694SB00702

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Four 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
DFBLK1	1234678-HpCDD	5.5 pg/L	2.8 ng/kg
DFBLK2B	OCDD	1.9 ng/kg	9.5 ng/kg
DFBLK1	1234678-HpCDF	3.7 pg/L	1.9 ng/kg
DFBLK4	OCDF	0.6 ng/kg	3.0 ng/kg

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 162DW00201 and equipment rinsate blank 162EW00201 collected on 1/2/97 were analyzed. There were no 2,3,7,8-substituted PCDD's and PCDF's detected in the field blanks, so no action was required.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed. No action was taken.

VII.) Duplicates:

One set of field duplicate samples, 693SB00101 / 693CB00101, was analyzed. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>693SB00101 (ng/kg)</u>	<u>693CB00101 (ng/kg)</u>	<u>RPD (%)</u>
123678-HxCDD	5.21	4.46	15.5
123789-HxCDD	2.56	2.80	9.0
1234678-HpCDD	61.4	50.2	20.1
OCDD	425	293	36.8
1234678-HpCDF	6.60	5.89	11.4
OCDF	15.8	10.3	42.1

All RPD's were within the 60% QC limit, so no action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" and "I" flags meaning "EMPC" were replaced with "EMPC" upon validation.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0195
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRIX: Soil
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 28195B (Level III)

SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	PCDD/ <u>PCDF</u>
694SB00301	28195.01	Soil	X
694SB00401	28195.02	Soil	X
694SB00801	28195.12	Soil	X
694SB00802	28195.13	Soil	X
694SB00901	28195.03	Soil	X
694SB00902	28195.04	Soil	X
694SB01001	28212.01	Soil	X
694SB01101	28195.05	Soil	X
694SB01102	28195.06	Soil	X
694SB01201	28212.09	Soil	X
694SB01202	28212.10	Soil	X
694SB01301	28195.07	Soil	X
694SB01401	28212.07	Soil	X
694SB01501	28212.02	Soil	X
694SB01502	28212.03	Soil	X
694SB01601	28195.08	Soil	X
694SB01602	28195.09	Soil	X
694SB01701	28212.04	Soil	X

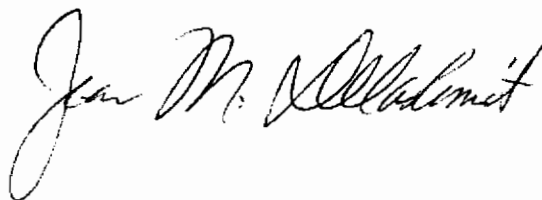
Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
694SB01702	28212.05	Soil	X
694SB01801	28212.06	Soil	X
694SB01901	28212.08	Soil	X
694SB02001	28195.10	Soil	X
694SB02002	28195.11	Soil	X
694SB00802MS	28195.14MS	Soil	+
694SB00802MSD	28195.15MSD	Soil	+
694SB01202MS	28212.11MS	Soil	+
694SB01202MSD	28212.12MSD	Soil	+

+ = Non-billable Analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 28195B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 694SB00301, 694SB00401, 694SB00801, 694SB00802, 694SB00901, 694SB00902, 694SB01001, 694SB01101, 694SB01102, 694SB01201, 694SB01202, 694SB01301, 694SB01401, 694SB01501, 694SB01502, 694SB01601, 694SB01602, 694SB01701, 694SB01702, 694SB01801, 694SB01901, 694SB02001, 694SB02002, 694SB00802MS, 694SB00802MSD, 694SB01202MS, 694SB01202MSD

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Two method blanks were analyzed. There were no 2,3,7,8-substituted PCDD's and PCDF's detected in the blanks, so no action was required.

Field Blanks:

Deionized water blank 162DW00201 and equipment rinsate blank 162EW00201 collected on 1/2/97 were analyzed in SDG 28083. There were no 2,3,7,8-substituted PCDD's and PCDF's detected in the field blanks, so no action was required.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

Two sets of MS/MSD samples (694SB00802MS / 694SB00802MSD and 694SB01202MS / 694SB01202MSD) were analyzed.

All criteria were met for spiked samples 694SB00802MS and 694SB00802MSD, so no action was taken.

The Relative Percent Difference (RPD) was 75% for OCDD in spiked samples 694SB01202MS and 694SB01202MSD, which exceeded the 50% QC limit. Since the positive result for OCDD in unspiked sample 694SB01202 (554 ng/kg) was less than 4X of the amount spike added (160 ng/kg), this sample result was flagged as estimated (J).

VII.) Duplicates:

No field duplicate set was analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" and "I" flags meaning "EMPC" were replaced with "EMPC" upon validation.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

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(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0210
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVELS: EPA Level III / IV
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994*

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals, Cyanide, Hexavalent Chromium (HexaCr), Explosives

SDG NUMBERS: 7090A (Appendix IX, Level IV)
7090B (Level III)

SAMPLES:

SDG 7090A (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Organophos.
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Pesticides</u>
694CB02101	7108.02	Soil	X	X	X	X

Client	Lab		Total			
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Metals</u>	<u>Cyanide</u>	<u>HexaCr</u>
694CB02101	7108.02	Soil	X	X	X	X

Client	Lab					
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>				<u>Explosives</u>
694CB02101	7108.02	Soil				X

CB = FIELD DUPLICATE (Corresponding sample 694SB02101 was analyzed in SDG 7090B.)

SDG 7090B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Organophos. Pesticide
694SB01001	7090.01	Soil	X	X	X	X
694SB01001RE	7090.01RE	Soil			+	
694SB01201	7090.09	Soil	X	X	X	X
694SB01202	7090.10	Soil	+	X	X	X
694SB01202RE	7090.10RE	Soil	X			
694SB01401	7090.07	Soil	X	X	X	X
694SB01401DL	7090.07DL	Soil			+	
694SB01501	7090.02	Soil	X	X	X	X
694SB01502	7090.03	Soil	X	X	X	X
694SB01701	7090.04	Soil	+	X	X	X
694SB01701RE	7090.04RE	Soil	X			
694SB01702	7090.05	Soil	X	X	X	X
694SB01801	7090.06	Soil	X	X	X	X
694SB01901	7090.08	Soil	X	X	X	X
694SB02101*	7108.01	Soil	X	X	X	X
694SB02201	7108.03	Soil	X	X	X	X
694SB02301	7108.04	Soil	X	X	X	X
694TB01702	7090.11	Soil	X			
694TB02101	7108.05	Water	X			
694SB02201MS	7108.03MS	Soil	+	+	+	+
694SB02201MSD	7108.03MSD	Soil	+	+	+	+

Client Sample #	Lab Sample #	Matrix	Herbicides	Total Metals	Cyanide	HexaCr
694SB01001	7090.01	Soil	X	X	X	X
694SB01201	7090.09	Soil	X	X	X	X
694SB01202	7090.10	Soil	X	X	X	X
694SB01401	7090.07	Soil	X	X	X	X
694SB01501	7090.02	Soil	X	X	X	X
694SB01502	7090.03	Soil	X	X	X	X
694SB01701	7090.04	Soil	X	X	X	X
694SB01702	7090.05	Soil	X	X	X	X
694SB01801	7090.06	Soil	X	X	X	X
694SB01901	7090.08	Soil	X	X	X	X
694SB02101*	7108.01	Soil	X	X	X	X
694SB02201	7108.03	Soil	X	X	X	X
694SB02301	7108.04	Soil	X	X	X	X
694SB01801MS	7090.06MS	Soil				+
694SB01801MD	7090.06MD	Soil				+
694SB02201MS	7108.03MS	Soil	+	+		
694SB02201MSD	7108.03MSD	Soil	+	+		

Client	Lab		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Explosives</u>
694SB01001	7090.01	Soil	X
694SB01201	7090.09	Soil	X
694SB01202	7090.10	Soil	X
694SB01401	7090.07	Soil	X
694SB01501	7090.02	Soil	X
694SB01502	7090.03	Soil	X
694SB01701	7090.04	Soil	X
694SB01702	7090.05	Soil	X
694SB01801	7090.06	Soil	X
694SB01901	7090.08	Soil	X
694SB02101*	7108.01	Soil	X
694SB02201	7108.03	Soil	X
694SB02301	7108.04	Soil	X
694SB02201MS	7108.03MS	Soil	+
694SB02201MSD	7108.03MSD	Soil	+

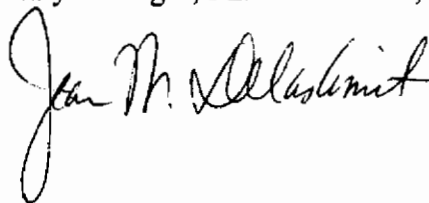
* = Corresponding duplicate sample 694CB02101 was analyzed in SDG 7090A.

+ = Non-billable analysis

DL = DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7090 Appendix IX Organics & Inorganics

SAMPLE: 694CB02101

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 2/02/97 on instrument HP2 for the following compounds:

acrolein	0.025
propionitrile	0.011
acetonitrile	0.013
isobutyl alcohol	0.012
1,4-dioxane	0.004

The results for these compounds in associated sample 694CB02101, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for the standards analyzed on 2/02/97 at 23:47 on instrument HP2 were below the 0.005 QC limit for the following compounds:

acrolein	0.027
propionitrile	0.011
acetonitrile	0.013
isobutyl alcohol	0.012
1,4-dioxane	0.004

The results for these compounds in the associated sample were previously rejected based on the initial

calibration. No further action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 2/02/97 at 23:47 on instrument HP2 for trichlorofluoromethane (32.3%). The non-detect result for this compound in associated sample 694CB02101 was flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

Acetonitrile, propionitrile, isobutyl alcohol and 1,4-dioxane were detected at 4 ug/kg, 2 ug/kg, 5 ug/kg and 10 ug/kg, respectively, in method blank VBS0202A. There were no positive results for these compounds in the associated sample. No action was required.

Trip Blanks:

Acetone was detected at 2.0 ug/L in trip blank 694TB02101, which was analyzed in SDG 7090B. The positive result for this compound in associated sample 694CB02101, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acrolein, propionitrile, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample 694CB02101 because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 2/07/97 on instrument HP5 for aramite (0.042). The non-detect result for this compound in associated sample 694CB02101 was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/07/97 on instrument HP5 for the following compounds:

hexachlorocyclopentadiene	46.9%
methapyrilene	73.1%
3,3'-dimethylbenzidine	79.3%
kepone	43.2%

These compounds were not detected in the associated sample. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

N-nitroso-di-n-propylamine was detected at 170 ug/kg in method blank EBS0123HP5. This compound was not detected in the associated sample. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect result for aramite in sample 694CB02101 was rejected (R) because of a low RRF in the initial calibration. All other laboratory data were acceptable without qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate samples in this SDG. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All LCS Recovery criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the sample:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB1	magnesium	3.90 ug/L	3.90 mg/kg
PBS	zinc	3.00 mg/kg	15.0 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All associated sample results were greater than 5X the blank amounts (Action Level, mg/kg for soil samples). No action was required.

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB3	antimony	-2.30 ug/L	2.30 mg/kg
CCB3	arsenic	-5.10 ug/L	5.10 mg/kg
CCB3	calcium	-27.0 ug/L	27.0 mg/kg
CCB3	chromium	-2.00 ug/L	2.00 mg/kg
CCB3	cobalt	-2.10 ug/L	2.10 mg/kg

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	nickel	-1.50 ug/L	1.50 mg/kg
CCB3	silver	-2.50 ug/L	2.50 mg/kg
CCB3	sodium	-5.60 ug/L	5.60 mg/kg

CCB = Continuing Calibration Blank

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met. No action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
cadmium	1 ug/L
manganese	6 ug/L
vanadium	3 ug/L
zinc	10 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-5 ug/L
barium	-2 ug/L
chromium	-5 ug/L
cobalt	-8 ug/L
lead	-1 ug/L
nickel	-7 ug/L
selenium	-4 ug/L
silver	-7 ug/L
sodium	-17 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) for sodium was 17.8% for the serial dilution analysis in this SDG, which exceeded the 10% QC limit. The positive result for this analyte in associated sample 694CB02101 was flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The Percent Recovery (%R) of antimony was 57.3% for the soil LCS, which was below the 80-120% QC limits. The non-detect result for antimony in the associated sample was flagged as estimated (UJ).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, 694CB02101 / 694SB02101 (analyzed in SDG 7090B), was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>694SB02101, mg/kg</u>	<u>694CB02101, mg/kg</u>	<u>RPD</u>
aluminum	10400	9610	7.9%
calcium	8100	9250	14%
iron	13500	12600	6.9%
zinc	37	37.2	0.5%

None of the Relative Percent Differences (RPD's) exceeded the 60% QC limit for soil samples. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding time to analysis was 17 days for sample 694CB02101, which exceeded the 24 hour QC limit. The non-detect result for this sample was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. Data qualification was not necessary.

III.) Blanks:

There were no detections in the method blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

There were no LCS's analyzed in this SDG. No action was taken.

V.) Laboratory Duplicates (MD):

MD analysis was not performed in this fraction of the SDG. No action was necessary.

VI.) Matrix Spike Recovery (MS):

MS analysis was not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for hexavalent chromium was not calculable for the set of field duplicate samples associated with this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

EXPLOSIVES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All HPLC Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 7090 CLP Organics and Inorganics

SAMPLES: 694SB01001, 694SB01001RE, 694SB01201, 694SB01202, 694SB01202RE, 694SB01401, 694SB01401DL, 694SB01501, 694SB01502, 694SB01701, 694SB01701RE, 694SB01702, 694SB01801, 694SB01901, 694SB02101, 694SB02201, 694SB002301, 694TB01702, 694TB02101, 694SB02201MS, 694SB02201MSD, 694SB01801MS, 694SB01801MD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 1/21/97 on instrument HP6 for the following compounds:

acrolein	0.009
acrylonitrile	0.025
propionitrile	0.010
acetonitrile	0.011
isobutyl alcohol	0.005
1,4-dioxane	0.003

The results for these compounds in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 694SB01001, 694SB01501, 694SB01502, 694SB01701RE, 694SB01901, 694SB01201, 694SB01202RE, 694TB01702, 694SB01702, 694SB01401 and 694SB01801.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 1/23/97 at 08:42 on instrument HP6 for the following compounds:

acrolein	0.008
acrylonitrile	0.025
propionitrile	0.009
acetonitrile	0.011
isobutyl alcohol	0.002
1,4-dioxane	0.003

The results for these compounds in the associated samples, which consisted entirely of non-detects, were previously rejected based on the initial calibration. No further action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 1/23/97 at 08:42 on instrument HP6 for isobutyl alcohol (52.6%). The results for this compound in the associated samples were previously rejected. No action was required.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was required.

Trip Blanks:

2-Hexanone was detected at 3 ug/kg in trip blank 694TB01702. There were no positive results for this compound in the associated samples. No action was required.

Acetone was detected at 2 ug/L in trip blank 694TB02101. All positive results for this compound in associated samples 694SB02101, 694SB02201 and 694SB02301 less than 10X the blank amount were flagged as undetected (U) with the analytical results below the CRQL being raised to the CRQL.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this

fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of 1,4-dichlorobenzene-d4 in samples 694SB01202RE and 694SB01701RE were 42.3% and 49.8%, respectively, which were below the 50-200% QC limits. The results for the compounds quantitated using this internal standard, which consisted entirely of non-detects for both samples, were flagged as estimated (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The reanalysis of sample 694SB01701 was considered by the validator to be of preferable data quality to the original analysis based on improved internal standards performance. The reanalysis of sample 694SB01201 was considered by the validator to be of preferable data quality to the original analysis based on improved surrogate recovery and internal standards performance.

The non-detect results for acrolein, acrylonitrile, propionitrile, acetonitrile, 1,4-dioxane and isobutyl alcohol in samples 694SB01001, 694SB01501, 694SB01502, 694SB01701RE, 694SB01901, 694SB01201, 694SB01202RE, 694TB01702, 694SB01702, 694SB01401 and 694SB01801 were rejected because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 1/30/97 on instrument HP5 for aramite (0.042). The non-detect result for this compound in associated sample 694SB01202 was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 1/30/97 on instrument HP5 for the following compounds:

pyridine	34.1%
n-nitrosodimethylamine	37.6%
hexachlorocyclopentadiene	34.5%
diallate	35.1%
methapyrilene	56.5%
3,3'-dimethylbenzidine	71.9%
kepone	31.5%
famphur	37.1%

These compounds were not detected in the associated samples. No action was required.

The Average Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 1/31/97 on instrument HP7 for aramite (0.047). The non-detect results for this compound in the associated samples were rejected (R). The associated samples were 694SB01001, 694SB01201, 694SB01501, 694SB01502, 694SB01701, 694SB01702, 694SB01801, 694SB01401 and 694SB01901.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 1/31/97 on instrument HP7 for the following compounds:

hexachlorocyclopentadiene	32.1%
methapyrilene	40.2%
3,3'-dimethylbenzidine	80.2%
kepone	37.4%
famphur	59.4%

These compounds were not detected in the associated samples. No action was required.

Continuing Calibration:

The Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 2/03/97 at 12:56 on instrument HP5 for aramite (0.046). The results for this compound in the associated samples were previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/03/97 at 12:56 on instrument HP5 for the following compounds:

n-nitrosodimethylamine	44.7%
diallate	27.1%
famphur	33.4%
hexachlorophene	28.2%

The results for these compounds in associated sample 694SB01202, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D) exceeded the 25% QC limit for the standards analyzed on 2/03/97 at 11:56 on instrument HP7 for the following compounds:

hexachlorocyclopentadiene	27.9%
3,3'-dimethylbenzidine	78.3%
kepone	32.0%
famphur	36.2%

The results for these compounds in associated sample 694SB01201, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) was 20% for acenaphthene in spiked samples 694SB02201MS and 694SB02201MSD, which exceeded the 19% QC limit. The non-detect result for this compound in unspiked sample 694SB02201 was flagged as estimated (UJ). In addition, the RPD for pyrene was 58% for spiked samples 694SB02201MS and 694SB02201MSD, which exceeded the 36% QC limit. The positive result for this compound in associated unspiked sample 694SB02201 was flagged as estimated (J).

The Percent Recovery (%R) of n-nitroso-di-n-propylamine was 40% for spiked sample 694SB02201MS, which was below the 41-126% QC limits. The non-detect result for this compound in unspiked sample 694SB02201 was flagged as estimated (UJ).

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite in all samples in this SDG were rejected because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB) were outside the 30-150% QC limits for the following samples:

Client Sample #	TCX, %R Column 1	TCX, %R Column 2	DCB, %R Column 1	DCB, %R Column 2
694SB01001	28.4		28.8	
694SB01401DL			300	
694SB01202			152	

All results for 694SB01001, which consisted entirely of non-detects, were flagged as estimated (UJ). The positive results for sample 694SB01202 were flagged as estimated (J).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for the following samples:

Sample	Compound	%D
694SB01701	heptachlor epoxide	93
694SB01801	heptachlor epoxide	168
	dieldrin	106
694SB01201	aldrin	94
694SB01401	aldrin	125
	heptachlor epoxide	353
	dieldrin	209
	4,4'-DDE	71
	endosulfan II	362

The detections of heptachlor epoxide and endosulfan II in sample 694SB01401 were rejected because the %D's exceeded 300%. The positive results for the other compounds in the associated samples were flagged as estimated (J).

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

The original analysis of sample 694SB00101 was considered by the validator to be of preferable data quality to the reanalysis because of better holding time.

There were no compound results exceeding the linear standard calibration range in the original analysis of sample 694SB01401. The dilution sample was not required. No action was taken.

The detections of heptachlor epoxide and endosulfan II were rejected in sample 694SB01401 because of high column %D's (greater than 300%). All other laboratory data were acceptable with qualifications.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of DCAA exceeded the 25-150% QC limits for the following samples:

<u>Client Sample #</u>	<u>Column 1, %R</u>	<u>Column 2, %R</u>
694SB01702	325	274
694SB01801	182	155
694SB01901	161	171
694SB01201	167	
694SB02101	153	
694SB02201	157	177
694SB02301	156	

Since there were no positive results in these samples, no action was required.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	magnesium	3.90 ug/L	3.90 mg/kg
PBS	zinc	3.00 mg/kg	15.0 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All associated sample results were greater than 5X the blank amounts (Action Level, mg/kg for soil samples). No action was required.

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB3	antimony	-2.30 ug/L	2.30 mg/kg
CCB3	arsenic	-5.10 ug/L	5.10 mg/kg
CCB3	calcium	-27.0 ug/L	27.0 mg/kg
CCB3	chromium	-2.00 ug/L	2.00 mg/kg
CCB3	cobalt	-2.10 ug/L	2.10 mg/kg
CCB3	nickel	-1.50 ug/L	1.50 mg/kg
CCB3	silver	-2.50 ug/L	2.50 mg/kg
CCB3	sodium	-5.60 ug/L	5.60 mg/kg

CCB = Continuing Calibration Blank

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met. No action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
cadmium	1 ug/L
manganese	6 ug/L
vanadium	3 ug/L
zinc	10 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-5 ug/L
barium	-2 ug/L
chromium	-5 ug/L
cobalt	-8 ug/L
lead	-1 ug/L
nickel	-7 ug/L
selenium	-4 ug/L
silver	-7 ug/L
sodium	-17 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) for sodium was 17.8% for the serial dilution analysis in this SDG, which exceeded the 10% QC limit. The positive results for this analyte in the associated samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The Percent Recovery (%R) of antimony was 57.3% for the soil LCS, which was below the 80-120% QC limits. The positive and non-detect results for antimony in the associated samples were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was required.

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (%R's) were below the 75-125% QC limits for antimony (53.7%), arsenic (70.3%), manganese (60.4%), mercury (51.2%) and selenium (65.6%). All positive and non-detect results for these analytes in the associated samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Field duplicate samples 694CB02101 (analyzed in SDG 7090A) and 694SB02101 were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	694SB02101, mg/kg	694CB02101, mg/kg	RPD
aluminum	10400	9610	7.9%
calcium	8100	9250	14%
iron	13500	12600	6.9%
zinc	37	37.2	0.5%

None of the Relative Percent Differences (RPD's) exceeded the 60% QC limit for soil samples. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding times from sampling to analyses were 17 days for all samples in this SDG, which exceeded the 24 hour QC limit. The non-detect results for these samples were flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

There were no positive detections in the blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

There were no LCS's analyzed in this SDG. No action was taken.

V.) Laboratory Duplicates (MD):

All MD criteria were met. No action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS criteria were met. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for hexavalent chromium was not calculable for the set of field duplicate samples in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

EXPLOSIVES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All HPLC Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

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(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0213
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS: EPA Level III / Level IV
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Diesel Range Organics (TPH-DRO), Gasoline Range Organics (TPH-GRO)
SDG NUMBERS: 28643A (Level IV, Appendix IX)
28643B (Level III)

SAMPLES:

SDG 28643A (Level IV):

Client	Lab		Volatile		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>TPH-DRO</u>	<u>TPH-GRO</u>
698HP00201*	28644-01	Water	X	X	X

* = Corresponding sample 698GP00201 was analyzed in SDG 28643B.

H = FIELD DUPLICATE

SDG 28643B (Level III):

Client	Lab		Volatile		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>TPH-DRO</u>	<u>TPH-GRO</u>
166GP03412	28658-04	Water	X		
166GP03426	28658-05	Water	X		
166GP03434	28658-06	Water	X		
166GP03434DL	28658-06DL	Water	+		

Client Sample #	Lab Sample #	Matrix	Volatile Organics	TPH-DRO	TPH-GRO
166GP03512	28658-01	Water	X		
166GP03512DL	28658-01DL	Water	+		
166GP03526	28658-02	Water	X		
166GP03526RE	28658-02RE	Water	+		
166GP03534	28658-03	Water	X		
166GP03534DL	28658-03RE	Water	+		
698GP00101	28643-01	Water	X	X	X
698GP00201*	28643-02	Water	X	X	X
698GP00301	28643-03	Water	X	X	X
166TP03434	28658-07	Water	X		
698TP00301	28643-04	Water	X		
166GP03412MS	28658-04MS	Water	+		
166GP03412MSD	28658-04MSD	Water	+		

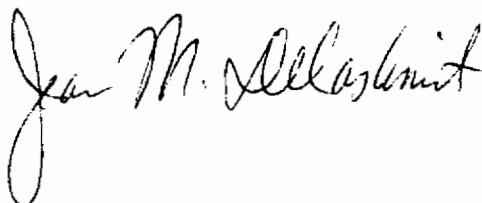
* = Corresponding duplicate sample 698HP00201 was analyzed in SDG 28643A.

+ = Non-billable analysis

DL = DILUTION, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28643A Appendix IX, CLP Organics

SAMPLE: 698HP00201

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 1/13/97 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results of these compounds in associated sample 698HP00201 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for dichlorodifluoromethane and 1,4-dioxane were 71.8% and 60.9%, respectively, for the standards analyzed on 1/13/97 on instrument N, which exceeded the 30% QC limit. The non-detect result for 1,4-dioxane was previously rejected because of a low RRF in this calibration. Dichlorodifluoromethane was not detected in the associated sample. No further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 2/27/97 at 09:27 on instrument N for the following compounds:

acrolein	0.047
acetonitrile	0.032
isobutyl alcohol	0.008
1,4-dioxane	0.002

The non-detect results for acetonitrile, isobutyl alcohol and 1,4-dioxane were previously rejected in associated sample 698HP00201 because of low RRF's in the initial calibration. The non-detect result of acrolein in this sample was rejected (R). No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/14/97 at 10:39 for the following compounds:

acrolein	61.8%
trans-1,4-dichloro-2-butene	52.2%
dichlorodifluoromethane	89.5%

The non-detect results for acrolein and trans-1,4-dichloro-2-butene were previously rejected in associated sample 698HP00201 because of low RRF's in the initial and continuing calibrations. The non-detect result for dichlorodifluoromethane in this sample was flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

Chloroform and total xylene were detected at 1 ug/L and 2 ug/L, respectively, in method blank VBLK1. These compounds were not detected in associated sample 698HP00201. No action was taken.

Trip Blanks:

Trichloroethene was detected at 3 ug/L in trip blank 166TP03434, which was analyzed in SDG 28643B. This compound was not detected in associated sample 698HW00201. No action was taken.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acrolein, trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample 698HP00201 because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with one qualification.

DIESEL RANGE ORGANICS (TPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (TPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28643B CLP Organics

SAMPLES: 166GP03412, 166GP03426, 166GP03434, 166GP03434DL, 166GP03512, 166GP03512DL, 166GP03526, 166GP03526RE, 166GP03534, 166GP03534DL, 698GP00101, 698GP00201, 698GP00301, 166TP03434, 698TP00301, 166GP03412MS, 166GP03412MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Chloroform and total xylene were detected at 1 ug/L and 2 ug/L, respectively, method blank VBLK1. There were no detections of these compounds in the associated samples. No action was required.

Total xylene was detected at 1 ug/L in method blank VBLK3. Xylene was not detected in the associated samples. No action was necessary.

Trip Blanks:

Trichloroethane was detected at 3 ug/L in trip blank 166TP03434. The detections of this compound in associated samples 166GP03426 and 166GP03526, which were less than 5X the blank amount, were flagged as undetected (U) with the detection limits being raised to the amount of contamination in each sample.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or trip blanks. No action was taken.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 122% for toluene-d8 in sample 166GP03526, which exceeded the 88-110% QC limits. The detections of 1,2-dichloroethene, ethylbenzene and total xylene were flagged as estimated (J).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recovery (%R) was 254% for 1,4-difluorobenzene in sample 166GP03526, which exceeded the 50-200% QC limits. All positive results in this sample were previously qualified based on Surrogate Recoveries. No further action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The detections of 1,2-dichloroethene in sample 166GP03534 and of trichloroethene in samples 166GP03434, 166GP03512 and 166GP03534 exceeded the linear standard calibration range. The corresponding results for these compounds in the dilution samples were transferred to the original analyses data on the spreadsheets. All CRQL criteria were met. No further action was required.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 166GP03526 was considered by the validator to be of preferable data quality as compared to the reanalysis because of better Surrogate and ISTD Recoveries. All laboratory

data were acceptable with qualifications.

DIESEL RANGE ORGANICS (TPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (TPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0215
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS: EPA Level III / Level IV
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Diesel Range Organics (TPH-DRO), Gasoline Range Organics (TPH-GRO)
SDG NUMBERS: 28684A (Level IV, Appendix IX)
28684B (Level III)

SAMPLES:

SDG 28684A (Level IV):

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>TPH-DRO</u>	<u>TPH-GRO</u>
166HP03612*	28685-01	Water	X		
166DP03634	28685-02	Water	X	X	X
698EP00401	28685-03	Water	X	X	X

* = Corresponding sample 166GP03612 was analyzed in SDG 28664B.

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, H = FIELD DUPLICATE

SDG 28684B (Level III):

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>TPH-DRO</u>	<u>TPH-GRO</u>
166GP03212	28684-04	Water	X		
166GP03226	28684-05	Water	X		
166GP03234	28684-06	Water	X		
166GP03234DL	28684-06DL	Water	+		

Client Sample #	Lab Sample #	Matrix	Volatile Organics	TPH-DRO	TPH-GRO
166GP03312	28684-07	Water	X		
166GP03326	28684-10	Water	X		
166GP03334	28684-11	Water	X		
166GP03334DL	28684-11DL	Water	+		
166GP03612*	28684-01	Water	X		
166GP03626	28684-02	Water	X		
166GP03634	28684-03	Water	X		
698GP00401	28684-14	Water	X	X	X
698GP00501	28684-13	Water	X	X	X
698GP00601	28684-12	Water	X	X	X
698TP00401	28684-15	Water	X		
166GP03312MS	28684-08MS	Water	+		
166GP03312MSD	28684-09MSD	Water	+		

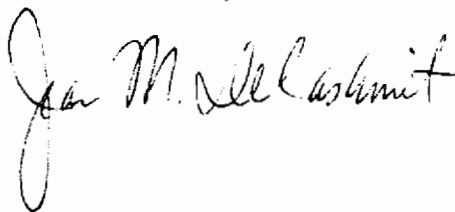
* = Corresponding field duplicate sample 166HP03612 was analyzed in SDG 28684A.

+ = Non-billable analysis

DL = DILUTION, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28684A Appendix IX, CLP Organics

SAMPLE: 166HP03612, 166DP03634, 698EP00401

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRFs) were below the 0.050 QC limit for the standards analyzed on 1/13/97 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for these compounds in associated sample 166HP03612, deionized water blank 166DP03634 and equipment rinsate blank 698EP00401 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for dichlorodifluoromethane and 1,4-dioxane were 71.8% and 60.9%, respectively, for the standards analyzed on 1/13/97 on instrument N, which exceeded the 30% QC limit. The non-detect results for 1,4-dioxane were previously rejected because of a low RRF in this calibration. Dichlorodifluoromethane was not detected in associated sample 166HP03612. No further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRFs) were below the 0.050 QC limit for the standards analyzed on 3/3/97 at 10:04 on instrument N for the following compounds:

acrolein	0.034
acetonitrile	0.031

isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for acetonitrile, isobutyl alcohol and 1,4-dioxane were previously rejected in the associated sample and field blanks because of low RRF's in the initial calibration. The non-detect results for acrolein in sample 166HP03612, deionized water blank 166DP03634 and equipment rinsate blank 698EP00401 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/3/97 at 10:04 for the following compounds:

acrolein	72.4%
trans-1,4-dichloro-2-butene	41.3%

The non-detect results for acrolein and trans-1,4-dichloro-2-butene were previously rejected in the associated sample and field blanks because of low RRF's in the initial and continuing calibrations. No further action was required.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was required.

Trip Blank:

Methylene chloride and acetone were detected at 24 ug/L and 6 ug/L, respectively, in trip blank 698TP00401, which was analyzed in SDG 28684B. No action was necessary.

Tentatively Identified Compounds (TIC):

2-Chloropropane was detected in the trip blank. This compound was not detected in the associated sample. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acrolein, trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample 166HP03612, deionized water blank 166DP03634 and equipment rinsate blank 698EP00401 because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (TPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (TPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

Deionized Water and Equipment Rinsate Blank:

Gasoline Range Organics were not detected in the two field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28684B CLP Organics

SAMPLES: 166GP03212, 166GP03226, 166GP03234, 166GP03234DL, 166GP03312, 166GP03326, 166GP03334, 166GP03334DL, 166GP03612, 166GP03626, 166GP03634, 698GP00401, 698GP00501, 698GP00601, 166TP00401, 166GP03312MS, 166GP03312MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 2/12/97 on instrument R exceeded the 30% QC limit for the following compounds:

chloroethane	36.7%
acetone	30.5%
2-chloroethyl vinyl ether	39.3%

There were no positive detections of these compounds in the associated samples after blank qualifications. No action was necessary.

Continuing Calibration:

The Percent Differences (D's) for the standards analyzed on 3/3/97 at 12:02 on instrument R exceeded the 25% QC limit for the following compounds:

chloroethane	38.3%
methylene chloride	50.8%
acetone	74.0%
2-butanone	42.6%
2-chloroethyl vinyl ether	62.5%

All results for these compounds in the associated samples, which consisted entirely of non-detects after blank qualifications, were flagged as estimated (UJ). The associated samples were 166GP03234, 166GP03312, 166GP03326, 166GP03334, 166GP03612, 698GP00401, 698GP00501 and 698GP00601.

IV.) Blanks:

Method Blanks:

Methylene chloride and acetone were detected at 12 ug/L and 5 ug/L, respectively, in method blank VBLK2. Blank qualifications of these two compounds in the associated samples were performed using the trip blank. No further action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no detections in the two field blanks, which were analyzed in SDG 28684A. No action was taken.

Trip Blank:

Methylene chloride and acetone were detected at 24 ug/L and 6 ug/L, respectively, trip blank 698TP00401. All detections of these two compounds in the associated samples, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL and the quantitation limit being raised to the amount of contamination in each sample for analytical results above the CRQL. The associated samples were 166GP03234, 166GP03312, 166GP03326, 166GP03334, 166GP03612, 698GP00401, 698GP00501 and 698GP00601.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or trip blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Five LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The detections of trichloroethene in samples 166GP03234 and 166GP03334 exceeded the linear standard calibration range. In addition, the detection of 1,2-dichloroethene exceeded the linear standard calibration range in sample 166GP03234. The corresponding results for these compounds in the dilution samples were transferred to the original analysis data on the spreadsheets. All CRQL criteria were met. No further action was required.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

DIESEL RANGE ORGANICS (TPH-DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks, which were analyzed in SDG 28684A. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (TPH-GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Gasoline Range Organics were not detected in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blank:

Gasoline Range Organics were not detected in the two field blanks, which were analyzed in SDG 28684A. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0217A
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994*

SAMPLE MATRIX: Soil
TYPES OF ANALYSES: Semivolatile Organics, PCB's, Total Metals, Arsenic

SDG NUMBER: 7233 (Level III)

SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Semi-</u> <u>volatiles</u>	<u>PCB's</u>	<u>Total</u> <u>Metals</u>	<u>Arsenic</u>
162SB00601	7233.01	Soil	X		X	
162SB00701	7233.02	Soil	X		X	
162SB00801	7233.03	Soil	X		X	
162SB00901	7233.04	Soil	X		X	
164SB01001	7233.07	Soil				X
164SB01002	7233.08	Soil				X
164SB01101	7233.09	Soil				X
164SB01102	7233.10	Soil				X
164SB01201	7233.11	Soil	X		X	
164SB01202	7233.12	Soil	X		X	
164SB01301	7233.13	Soil	X		X	
164SB01307	7233.14	Soil	X		X	
164SB01401	7233.15	Soil				X
164SB01402	7233.16	Soil				X
696SB00701	7233.05	Soil		X		
696SB00801	7233.06	Soil		X		
696SB00801DL	7233.06DL	Soil		+		
162SB00601MS	7233.01MS	Soil			+	
162SB00601MD	7233.01MD	Soil			+	

DL = DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE: 

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7233 CLP Organics and Inorganics

SAMPLES: 162SB00601, 162SB00701, 162SB00801, 162SB00901, 164SB01001, 164SB01002, 164SB01102, 164SB01201, 164SB01202, 164SB01301, 164SB01307, 164SB01401, 164SB01402, 696SB00701, 696SB00801, 696SB00801DL, 162SB00601MD, 162SB00601MS

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 2/18/97 on instrument HP1 for 2,4-dinitrophenol (31.9%). There were no positive results for this compound in the associated samples. No action was required.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 2/24/97 on instrument HP1 for 2,4-dinitrophenol (39.4%). There were no positive results for this compound in the associated samples. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no detections in the method blanks in this SDG. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in the SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND ARSENIC

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	aluminum	40.4 ug/L	40.4 mg/kg
CCB4	calcium	24.5 ug/L	24.5 mg/kg
CCB3	selenium	2.60 ug/L	2.60 mg/kg
CCB3	silver	1.80 ug/L	1.80 mg/kg
PBS	zinc	3.18 mg/kg	15.9 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount, after correction for percent moisture, (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

A negative result with an absolute value greater than the IDL was observed for lead (-1.50 ug/L) in the first continuing calibration blank. All associated sample results were greater than 5X the absolute value of the negative blank result (1.50 mg/kg). No action was required.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met. No action was taken.

The following analytes were detected in ICS Solution A at positive concentrations greater than the IDL:

antimony	3 ug/L
arsenic	2 ug/L
cadmium	1 ug/L
copper	2 ug/L
manganese	9 ug/L
zinc	11 ug/L

These analytes should not be present. Additionally, negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
cobalt	-4 ug/L
lead	-2 ug/L
nickel	-4 ug/L
selenium	-8 ug/L
silver	-4 ug/L
sodium	-10 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) of calcium was 12.7% for serial dilution sample 162SB00601L, which exceeded the 10% QC limit. All positive results for this analyte in the samples for total metals were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The Percent Recovery (%R) of antimony was 57.9% for the soil LCS, which was below the 80-120% QC limits. All positive and non-detect results for this analyte in the samples were flagged as estimated (J) and (UJ).

VII.) Duplicate Sample Analysis:

The Relative Percent Difference (RPD) of calcium was 80.4% for spiked duplicate 162SB00601MD, which exceeded the 35% QC limit for soil samples. All results for calcium in the associated samples were positive results and were flagged as estimated (J).

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (%R's) for spiked sample 162SB00601MS were below the 75-125% QC limits for the following analytes:

<u>Analyte</u>	<u>%R</u>
antimony	58.2
barium	24.2
beryllium	24.5
chromium	26.3
cobalt	23.9
copper	25.4
manganese	23.5
mercury	39.3
nickel	24.6
selenium	69.7
silver	25.7
vanadium	25.3

All positive results for these analytes in the associated samples were flagged as estimated (J). All non-detect results for antimony, mercury and selenium were flagged as estimated (UJ). All non-detect results for the other analytes were rejected (R) because the %R's were less than 30%.

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications. The analytical result for arsenic in sample 164SB01101 was not reported on the spreadsheet or in the electronic data. The Form I for this analysis is included with the spreadsheets in this report. This result was acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0217B
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994*

SAMPLE MATRIX: Soil
TYPES OF ANALYSIS: PCB's

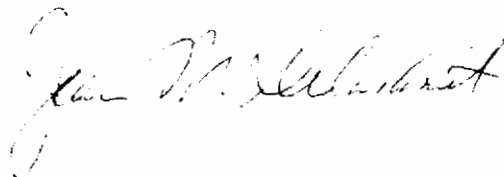
SDG NUMBER: 7246 (Level III)

SAMPLE:

Client	Lab		
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>PCB's</u>
696SB00901	7246.01	Soil	X

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation. - 7246 CLP Organics

SAMPLE: 696SB00901

PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil and GPC data were not included in the SDG data package. No action was required.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0222
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994*
SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics
SDG NUMBER: 28895 (Level III)

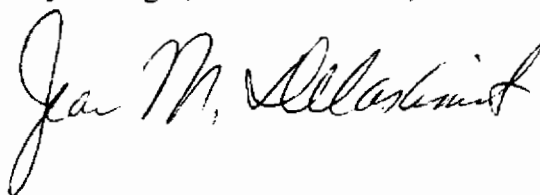
<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Volatile</u> <u>Organics</u>
166GP03836	28911.03	Water	X
166GP03836RE	28911.03RE	Water	+
166GP03911	28895.07	Water	X
166GP03911DL	28895.07DL	Water	+
166GP04211	28895.01	Water	X
166GP04234	28895.02	Water	X
166GP04234DL	28895.02DL	Water	+
166GP04535	28895.03	Water	X
166GP04824	28895.04	Water	X
166GP04926	28895.05	Water	X
166GP04926DL	28895.05DL	Water	+
166GP05124	28925.04	Water	X
166GP05210	28895.06	Water	X
166GP05324	28911.04	Water	X
166GP05333	28911.05	Water	X
166GP05424	28911.06	Water	X
166GP05424DL	28911.06DL	Water	+
166GP05433	28911.07	Water	X
166GP05433DL	28911.07DL	Water	+
166GP05811	28911.01	Water	X
166GP05811DL	28911.01DL	Water	+

Client Sample #	Lab Sample #	Matrix	Volatile Organics
166GP05924	28911.02	Water	X
166GP06133	28925.01	Water	X
166GP06133DL	28925.01DL	Water	+
166GP06234	28925.02	Water	X
166GP06333	28925.03	Water	X
166GP06333DL	28925.03DL	Water	+
166TP03911	28895.08	Water	X
166TP05124	28925.05	Water	X
166TP05433	28911.08	Water	X
166GP04211MS	28895.01MS	Water	+
166GP04211MSD	28895.01MSD	Water	+
166GP05811MS	28911.01MS	Water	+
166GP05811MSD	28911.01MSD	Water	+
166GP06234MS	28925.02MS	Water	+
166GP06234MSD	28925.02MSD	Water	+

DL = DILUTION, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28895 CLP Organics

SAMPLES: 166GP03836, 166GP03836RE, 166GP03911, 166GP03911DL, 166GP04211, 166GP04234, 166GP04234DL, 166GP04535, 166GP04824, 166GP04926, 166GP04926DL, 166GP05124, 166GP05210, 166GP05324, 166GP05333, 166GP05424, 166GP05424DL, 166GP05433, 166GP05433DL, 166GP05811, 166GP05811DL, 166GP05924, 166GP06133, 166GP06133DL, 166GP06234, 166GP06333, 166GP06333DL, 166TP03911, 166TP05124, 166TP05433, 166GP04211MS, 166GP04211MSD, 166GP05811MS, 166GP05811MSD, 166GP06234MS, 166GP06234MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC/MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 3/20/97 on instrument R for the following compounds:

bromomethane	32.2%
chloroethane	38.4%
methylene chloride	51.3%
acetone	65.8%
4-methyl-2-pentanone	30.9%
2-hexanone	44.8%

All positive results for acetone and methylene chloride in the associated samples were flagged as estimated (J). The associated samples were 166GP04211, 166GP04234, 166GP04535, 166GP04824, 166GP04926, 166GP05210, 166GP03911, 166GP06333, 166GP06333DL, 166GP04234DL, 166GP04926DL, 166GP05433, 166GP05433DL, 166GP05424DL and 166GP06234. Since the results for the other compounds consisted entirely of non-detects, no further action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/21/97

at 10:09 on instrument R for methylene chloride (25.6%). The positive results for methylene chloride in associated samples 166GP04234DL and 166GP04926DL were previously flagged based on the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/26/97 at 08:31 on instrument R for the following compounds:

bromomethane	34.4%
chloroethane	42.6%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GP05333, 166GP05433DL, 166GP05424DL, 166GP06333, 166GP06333DL and 166GP06234.

The Percent Difference (%D) was 38.3% for 2-hexanone in the standards analyzed on 3/24/97 at 11:07 on instrument U, which exceeded the 25% QC limit. The results for this compound in the associated samples, which were both non-detects, were flagged as estimated (UJ). The associated samples were 166GP06133 and 166GP05424.

IV.) Blanks:

Method Blanks:

Acetone and methylene chloride were detected at 8 ug/L and 4 ug/L, respectively, in method blank VBLK2. There were no positive results for methylene chloride less than 10X the blank amount in the associated samples. Acetone was not detected in the associated samples. No action was required.

Methylene chloride was detected at 2 ug/L in method blank VBLK5. There were no positive results for this compound in the associated samples, so no action was required.

Acetone was detected at 4 ug/L in method blank VBLK7. The positive results for this compound in associated samples 166GP06333 and 166GP06234, which were less than 10X the blank amount, were flagged as undetected (U) with the detection limits being raised to the level of contamination in each sample.

Trip Blanks:

There were no detections in the trip blanks analyzed in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of the following surrogates were outside their QC limits for sample 166GP03836:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limit</u>
toluene-d8	127	88-110%
bromofluorobenzene	85	86-115%

The results for this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for trichloroethene was 18% for spiked samples 166GP05811MS and 166GP05811MSD, which exceeded the 14% QC limit. The positive result for this compound in unspiked sample 166GP05811 was flagged as estimated (J).

The Relative Percent Difference (RPD) for trichloroethene was 28% for spiked samples 166GP06234MS and 166GP06234MSD, which exceeded the 14% QC limit. The positive result for this compound in associated unspiked sample 166GP06234 was flagged as estimated (J).

The Relative Percent Differences (RPD's) exceeded the QC limits for spike samples 166GP04211MS and 166GP04211MSD for the following compounds:

<u>Compound</u>	<u>RPD</u>	<u>QC Limits</u>
1,1-dichloroethene	27%	14%
trichloroethene	54%	14%
benzene	24%	11%
toluene	22%	13%
chlorobenzene	24%	13%

The positive and non-detect results for these compounds in associated unspiked sample 166GP04211 were flagged as estimated (J) and (UJ).

The Percent Recovery (%R) of trichloroethene was 140% for spiked sample 166GP04211MS, which exceeded the 71-120% QC limits. The result for this compound in the associated sample was previously flagged. No further action was required.

The Percent Recovery (%R) of trichloroethene was 60% for spiked sample 166GP06234MSD, which was below the 71-120% QC limits. The result for this compound in the associated sample was previously flagged. No further action was required.

VII.) Laboratory Control Samples (LCS):

Seven LCS's were analyzed for this SDG. Several Percent Recoveries (%R's) were outside their QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) exceeded the 50-200% QC limits for bromochloromethane (268%), 1,4-difluorobenzene (449%) and chlorobenzene-d5 (325%) in sample 166GP03836. Since there were no positive results for this sample, no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentrations of trichloroethene in samples 166GP03911, 166GP04234, 166GP04926, 166GP05424, 166GP05433, 166GP05811, 166GP06133 and 166GP06333 exceeded the standard calibration range. The concentrations of this compound in the original analyses were replaced by the validator with the diluted sample results with the appropriate (D) qualifier. All other CRQL criteria were met, so no further action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 166GP03836 was considered by the validator to be of preferable data quality to the reanalysis based on its better holding time since the reanalysis did not yield improved surrogate or internal standards performance. All other laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0224
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPE OF ANALYSIS: Volatile Organics
SDG NUMBER: 28998 (Level III)

SAMPLES:

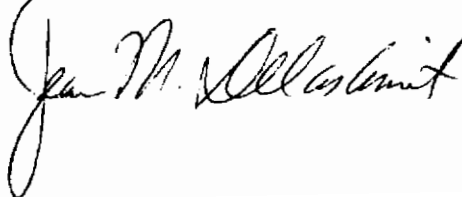
<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Volatile</u> <u>Organics</u>
166GP06424	28998-03	Water	X
166GP06514	28998-04	Water	X
166GP06726	28998-05	Water	X
166GP06726DL	28998-05DL	Water	+
166GP06826	28998-06	Water	X
166GP06932	28998-01	Water	X
166GP07234	28998-02	Water	X
166TP06826	28998-07	Water	X
166GP06826MS	28998-0	Water	+
166GP06626MSD	28998-0	Water	+

+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

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- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 28998 CLP Organics

SAMPLES: 166GP06424, 166GP06514, 166GP06726, 166GP06726DL, 166GP06826,
166GP06932, 166GP07234, 166TP06826, 166GP06424MS, 166GP06424MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was taken.

Trip Blank:

There were no detections in trip blank 166TP06826. No action was required.

TIC's:

TIC's were not detected in the method or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentration of trichloroethene in sample 166GP06726 exceeded the standard calibration range. The concentration of trichloroethene in the original analysis was replaced by the validator with the diluted sample (166G906726DL) result with the appropriate qualifier (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The SDG number was incorrectly listed as "28898" on the spreadsheets. This was corrected by the validator to read "28998". All other laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0226
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRICES: Soil and Water
TYPE OF ANALYSIS: Volatile Organics
SDG NUMBERS: 7500 (Level III)
7500.1 (Level III)

SAMPLES:

SDG 7500:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>
ASRSB00101	7500-07	Soil	X
ASRSB00102	7500-08	Soil	X
ASRSB00201	7500-05	Soil	+
ASRSB00201RE	7500-05RE	Soil	X
ASRSB00202	7500-06	Soil	X
ASRSB00301	7500-03	Soil	+
ASRSB00301RE	7500-03RE	Soil	X
ASRSB00302	7500-04	Soil	X
ASRSB00401	7500-01	Soil	X
ASRSB00402	7500-02	Soil	X
ASRSB00501	7500-09	Soil	+
ASRSB00501RE	7500-09RE	Soil	X
ASRSB00502	7500-10	Soil	X
ASRSB00601	7500-19	Soil	+
ASRSB00601RE	7500-19RE	Soil	X
ASRSB00602	7500-20	Soil	+
ASRSB00602RE	7500-20RE	Soil	X
ASRSB00901	7500-11	Soil	+
ASRSB00901RE	7500-11RE	Soil	X

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>
ASRSB00902	7500-12	Soil	X
ASRSB01001	7500-17	Soil	+
ASRSB01001RE	7500-17RE	Soil	X
ASRSB01002	7500-18	Soil	X
ASRSB01101	7500-15	Soil	+
ASRSB01101RE	7500-15RE	Soil	X
ASRSB01102	7500-16	Soil	X
ASRSB01301	7500-13	Soil	+
ASRSB01301RE	7500-13RE	Soil	X
ASRSB01302	7500-14	Soil	X
ASRSB00502MS	7500-10MS	Soil	+
ASRSB00502MSD	7500-10MSD	Soil	+

SDG 7500.1:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>
ASRSB00701	7500-21	Soil	X
ASRSB00702	7500-22	Soil	X
ASRSB00702DL	7500-22DL	Soil	+
ASRSB00801	7500-25	Soil	X
ASRSB00801DL	7500-25DL	Soil	+
ASRSB00802	7500-26	Soil	X
ASRSB01201	7500-23	Soil	X
ASRSB01201RE	7500-23RE	Soil	+
ASRSB01202	7500-24	Soil	X
ASRSB01401	7500-29	Soil	+
ASRSB01401RE	7500-29RE	Soil	X
ASRSB01402	7500-30	Soil	X
ASRSB01501	7500-31	Soil	X
ASRSB01501RE	7500-31RE	Soil	+
ASRSB01502	7500-32	Soil	X
ASRSB01601	7500-27	Soil	+
ASRSB01601RE	7500-27RE	Soil	X
ASRSB01602	7500-28	Soil	X
ASRSB01602RE	7500-28RE	Soil	+
ASRTB01502	7500-33	Water	X
ASRSB01502MS	7500-26MS	Soil	+
ASRSB01502MSD	7500-26MSD	Soil	+

DL = DILUTION, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS,
T = TRIP BLANK, + = Non-billable analysis

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7500 CLP Volatile Organics

SAMPLES: ASRSB00101, ASRSB00102, ASRSB00201, ASRSB00201RE, ASRSB00202, ASRSB00301, ASRSB00301RE, ASRSB00302, ASRSB00401, ASRSB00402, ASRSB00501, ASRSB00501RE, ASRSB00502, ASRSB00601, ASRSB00601RE, ASRSB00602, ASRSB00602RE, ASRSB00901, ASRSB00901RE, ASRSB00902, ASRSB01001, ASRSB01001RE, ASRSB01002, ASRSB01101, ASRSB01101RE, ASRSB01102, ASRSB01301, ASRSB01301RE, ASRSB01302, ASRSB00502MS, ASRSB00502MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 32.8% for acetone in the standards analyzed on 4/8/97 on instrument HP6, which exceeded the 30% QC limit. Since there were no detections of acetone in the associated samples after blank qualifications, no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

Acetone was detected at 2 ug/L each in method blanks VBLK0408C and VBLK0409A. The trip blank was used for blank qualifications. No further action was taken.

Trip Blank:

Acetone was detected at 5 ug/L in trip blank ASRTB01502, which was analyzed in SDG 7500.1. The

detections of acetone in all associated SDG samples, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

Three LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) were below the 50-200% QC limits for chlorobenzene in samples ASRSB00201RE (49%), ASRSB00601RE (49%), ASRSB01001RE (44%) and ASRSB1101RE (46%). All results for compounds quantitated on this internal standard in these four samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The reanalyses of samples ASRSB00201, ASRSB00301, ASRSB00501, ASRSB000901 and ASRSB01301 were considered by the validator to be of preferable data quality to the original analyses because of improved internal standard recoveries. The reanalyses of samples ASRSB00601, ASRSB00602, ASRSB01001 and ASRSB01101 were considered by the validator to be of preferable data quality because of better surrogate recoveries and improved internal standard recoveries. All laboratory data were acceptable with qualifications.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7500.1 CLP Volatile Organics

SAMPLES: ASRSB00701, ASRSB00702, ASRSB00702DL, ASRSB00801, ASRSB00801DL, ASRSB00802, ASRSB01201, ASRSB01201RE, ASRSB01202, ASRSB01401, ASRSB01401RE, ASRSB01402, ASRSB01501, ASRSB01501RE, ASRSB01502, ASRSB01601, ASRSB01601RE, ASRSB01602, ASRSB01602RE, ASRTB01502, ASRSB01502MS, ASRSB01502MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 32.8% for acetone in the standards analyzed on 4/8/97 on instrument HP6, which exceeded the 30% QC limit. Since there were no detections of acetone in the associated samples after blank qualifications, no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

Acetone was detected at 2 ug/L, 2 ug/L and 3 ug/L, respectively, in method blanks VBLK0409A, VBLK410A and VBLK0410B. The trip blank was used for blank qualifications. No further action was taken.

Trip Blank:

Acetone was detected at 5 ug/L in trip blank ASRTB01502. The detections of acetone in all associated SDG samples, except ASRSB00701, which were less than 10X the blank amount, were flagged as

undetected (U) with detections below the CRQL being raised to the CRQL. The detection of acetone in sample ASRSB00701 exceeded 10X the blank amount. No further action was required.

TIC's:

TIC's were not detected in the method or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 69% for bromofluorobenzene in sample ASRSB01201, which was below the 70-127% QC limits. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Sample (LCS):

Five LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) of trichloroethene was 18% for spiked samples ASRSB00802MS and ASRSB00802MSD, which exceeded the 17% QC limit. The detection of this compound in associated unspiked sample ASRSB00802 was flagged as estimated (J).

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) were below the 50-200% QC limits for 1,2-difluorobenzene (48%) and chlorobenzene (44%) in sample ASRSB01401RE. All positive and non-detect results for compounds quantitated using these two internal standards in the sample were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentrations of trichloroethene in samples ASRSB00702 and ASRSB00801 exceeded the standard calibration range. The concentrations of trichloroethene in the original analyses were replaced by the validator with the diluted sample (ASRSB00702DL and ASRSB00801DL) results and the appropriate qualifier (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The reanalyses of samples ASRSB01401 and ASRSB01601 were considered by the validator to be of preferable data quality to the original analyses because of improved internal standard recoveries. The original analyses of samples ASRSB01201, ASRSB01501 and ASRSB01602 were considered by the validator to be of preferable data quality because of better surrogate recoveries and holding times. All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0227
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRIX: Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 29123A (Level IV)

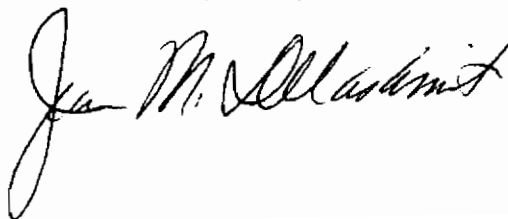
SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
163HW00102	29137.01	Water	X
GDKDW00102	29123.01	Water	X
GDKEW00102	29123.02	Water	X
GDKFW00102	29123.03	Water	X

D=DEIONIZED WATER BLANK, E=EQUIPMENT RINSATE BLANK, F=FIELD BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 29123A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 163HW00102, GDKDW00102, GDKEW00102, GDKFW00102

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
DFBLK1	1234678-HpCDD	4.6 pg/L	23 pg/L
DFBLK2	OCDD	58.8 pg/L	294 pg/L
DFBLK1	1234678-HpCDF	3.0 pg/L	15 pg/L

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank GDKDW00102, equipment rinsate blank GDKEW00102 and field blank GDKFW00102 were analyzed in this SDG. Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
GDKFW00102	1234678-HpCDD	8.1 pg/L	41 pg/L
GDKFW00102	OCDD	56.2 pg/L	281 pg/L
GDKFW00102	1234678-HpCDF	3.4 pg/L	17 pg/L

Detections of these compound in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

No field duplicates set was analyzed in this SDG. No action was required.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0228
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994

SAMPLE MATRIX: Water
TYPE OF ANALYSIS: Volatile Organics

SDG NUMBER: 29236 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics
166GP07511	79248-09	Water	X
166GP07519	79248-10	Water	X
166GP07524	79248-11	Water	X
166GP07612	79248-05	Water	X
166GP07620	79248-06	Water	X
166GP07625	79248-07	Water	X
166HP07625	79248-08	Water	X
166GP07712	79248-01	Water	X
166GP07720	79248-02	Water	X
166HP07720	79248-03	Water	X
166GP07725	79248-04	Water	X
166GP07812	79236-08	Water	X
166GP07820	79236-09	Water	X
166GP07830	79236-10	Water	X
166HP07830	79236-11	Water	X
166GP07912	79236-04	Water	X
166GP07920	79236-05	Water	X
166HP07920	79236-06	Water	X
166GP07932	79236-07	Water	X
166GP08011	79236-01	Water	X
166GP08020	79236-02	Water	X

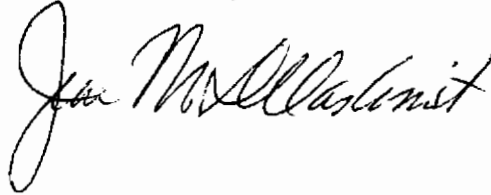
Client	Lab		Volatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
166GP08032	79236-03	Water	X
166TP07524	79248-12	Water	X
166TP07830	79236-12	Water	X
166GP07712MS	79248-01MS	Water	+
166GP07712MSD	79248-01MSD	Water	+

+ = Non-billable QC analysis

H = FIELD DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 29236 CLP Volatile Organics

SAMPLES: 166GP07511, 166GP07519, 166GP07524, 166GP07612, 166GP07620, 166GP07625, 166HP07625, 166GP07712, 166GP07720, 166HP07720, 166GP07725, 166GP07812, 166GP07820, 166GP07830, 166HP07830, 166GP07912, 166GP07920, 166HP07920, 166GP07932, 166GP08011, 166GP08020, 166GP08032, 166TP07524, 166TP07830, 166GP07712MS, 166GP07712MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) were 34.7% and 42.2%, respectively, for bromomethane and chloroethane in the standards analyzed on 4/28/97 on instrument R, which exceeded the 30% QC limit. These compounds were not detected in the associated samples, so no action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 5/2/97 at 09:32 on instrument N for the following compounds:

acetone	36.5%
2-butanone	35.8%
4-methyl-2-pentanone	26.8%
2-hexanone	26.6%

All results for these compounds in associated samples 166GP07912, 166GP07920 and 166HP07920, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Difference (%D) was 27.4% for 2-butanone in the standard analyzed on 5/5/97 at 09:35 on instrument N, which exceeded the 25% QC limit. All results for this compound in the associated

samples, which consisted entirely of non-detects, were flagged as estimated (J). The associated samples were 166GP07511, 166GP07519, 166GP07524, 166GP07612, 166GP07620, 166GP07625, 166HP07625, 166GP07712, 166GP07720, 166HP07720, 166GP07725, 166GP07812, 166GP07820, 166GP07932, 166GP08020, 166GP08032.

IV.) Blanks:

Method Blanks:

Chloroform was detected at 1 ug/L in each of method blanks VBLK1, VBLK2 and VBLK3. The detection of chloroform in sample 166GP08011, which was less than 5X the blank amounts, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL. Chloroform was not detected in the other SDG samples. No further action was necessary.

Methylene chloride was detected at 3 ug/L in method blank VBLK3. Since trip blank 166TP07830 was for blank qualification of this compound, no further action was necessary.

Trip Blank:

Acetone and methylene chloride were detected at 5 ug/L and 7 ug/L, respectively, in trip blank 166TP07830. The detections of acetone and methylene chloride in associated samples 166GP07830, 166HP07830, 166GP08011 and 166GP08020, which were less than 10X the blank amounts, were flagged as undetected (U) with the quantitation limit being raised to the level of sample contamination or detections below the CRQL being raised to the CRQL.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

Six LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

Four sets of field duplicate samples were analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>166GP07720</u>	<u>166HP07720</u>	<u>RPD</u>
1,2-dichloroethene	10 ug/L	10 ug/L	0%
trichloroethene	18 ug/L	16 ug/L	12%
tetrachloroethene	46 ug/L	35 ug/L	27%

<u>Compound</u>	<u>166GP07920</u>	<u>166HP07920</u>	<u>RPD</u>
1,2-dichloroethene	7 ug/L	7 ug/L	0%
trichloroethene	100 ug/L	110 ug/L	10%
tetrachloroethene	100 ug/L	97 ug/L	3%

There were no calculable RPD's for the other two field duplicate sample pairs. Since all RPD's were less than the 30% QC limit for water samples, no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

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(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0229
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVELS: EPA Level III / Level IV
EPA METHODS: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Chlorinated Herbicides, Organophosphorus Pesticides, Diesel Range Organics (DRO), Gasoline Range Organics (GRO), Total Metals, Cyanide, Hexavalent Chromium

SDG NUMBERS: 7566A (Appendix IX, Level IV)
7566B (Level III)

SAMPLES:

SDG 7566A (Level IV):

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi- volatiles</u>	<u>Pesticides/ PCB's</u>	<u>Chlorinated Herbicides</u>	<u>Organophos. Pesticides</u>
163HW00102*	7573-04	Water	X	X	X	X	X
GDKDW00102	7566-02	Water	X	X	X	X	X
GDKEW00102	7566-03	Water	X	X	X	X	X
GDKFW00102	7566-04	Water	X	X	X	X	X

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>DRO</u>	<u>GRO</u>	<u>Total Metals</u>	<u>Cyanide</u>	<u>Hexavalent Chromium</u>
163HW00102*	7573-04	Water			X	X	X
GDKDW00102	7566-02	Water	X	X	X	X	X
GDKEW00102	7566-03	Water	X	X	X	X	X
GDKFW00102	7566-04	Water	X	X	X	X	X
163HW00102MD	7573-04MD	Water					+
163HW00102MS	7573-04MS	Water					+

Client	Lab				Total		Hexavalent
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>DRO</u>	<u>GRO</u>	<u>Metals</u>	<u>Cyanide</u>	<u>Chromium</u>
GDKFW00102MD	7566-04MD	Water					+
GDKFW00102MS	7566-04MS	Water					+

* = Corresponding sample 163GW00102 was analyzed in SDG 7566B.

+ = Non-billable Quality Control sample

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK,
HW = FIELD DUPLICATE, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE

SDG 7566B (Level III):

Client	Lab		Volatile	Semi-	Pesticides/	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>GRO</u>
161GW00102	7580-02	Water	X	X	X	X
162GW00102	7573-02	Water	X	X	X	X
162GW00202	7573-01	Water	X	X	X	X
163GW00102*	7573-03	Water	X	X	X	
166GW00102	7580-01	Water	X	X	X	
698GW00102	7580-03	Water	X	X	X	X
GDKGW00102	7566-01	Water	X	X	X	X
GDKGW00202	7566-05	Water	X	X	X	X
163TW00102	7573-05	Water	X			
698TW00102	7580-04	Water	X			
GDKTW00202	7566-06	Water	X			
163GW00102MS	7580-01MS	Water	+	+	+	
163GW00102MSD	7580-01MSD	Water	+	+	+	
GDKGW00102MS	7566-01MS	Water				+
GDKGW00102MSD	7566-01MSD	Water				+

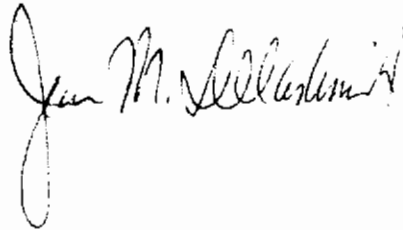
Client	Lab			Total	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>GRO</u>	<u>Metals</u>	<u>Cyanide</u>
161GW00102	7580-02	Water	X	X	X
162GW00102	7573-02	Water	X	X	X
162GW00202	7573-01	Water	X	X	X
163GW00102*	7573-03	Water		X	X
166GW00102	7580-01	Water		X	X
698GW00102	7580-03	Water	X	X	X
GDKGW00102	7566-01	Water	X	X	X
GDKGW00202	7566-05	Water	X	X	X
GDKGW00102MS	7566-01MS	Water	+		
GDKGW00102MSD	7566-01MSD	Water	+		
161GW00102MS	7580-02MS	Water	+		
161GW00102MSD	7580-02MSD	Water	+		
166GW00102MD	7580-01MD	Water		+	+
166GW00102MS	7580-01MS	Water		+	+

* = Corresponding duplicate sample 163HW00102 was analyzed in SDG 7566A.
+ = Non-billable Quality Control sample

MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large, looping initial "J".

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7566A Appendix IX, CLP Organic and Inorganics

SAMPLES: 163HW00102, GDKDW00102, GDKEW00102, GDKFW00102, 163HW00102MD, 163HW00102MS, GDKFW00102MD, GDKFW00102MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for the standards analyzed on 4/24/97 on instrument HP6 were below the 0.050 QC limit for the following compounds:

acrolein	0.009
acrylonitrile	0.037
propionitrile	0.014
acetonitrile	0.016
isobutyl alcohol	0.009
1,4-dioxane	0.003

The non-detect results for these compounds in the sample and three field blanks were rejected (R).

Continuing Calibration:

No continuing calibration analysis was performed in this SDG. Calibration was based solely on the initial calibration. No action was required.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Trip Blanks:

Acetone was detected at 5 ug/L and 3 ug/L, respectively, in trip blanks 163TW00102 and 698TW00102, which were analyzed in SDG 7566B. Since acetone was not detected in sample 163HW00102, no action was necessary.

Field Blanks:

Acetone was detected at 2 ug/L and 7 ug/L, respectively, in deionized water blank GDKDW00102 and field blank GDKFW00102. Since acetone was not detected in sample 163HW00102, no action was taken.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method, field or trip blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences in the two field duplicate samples. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the spreadsheets. Validated copies of the Form I's are included with the spreadsheets for this fraction of the SDG.

The non-detect results for acrolein, acrylonitrile, propionitrile, acetonitrile, isobutyl alcohol and 1,4-dioxane in the associated sample and three field blanks were rejected because of low RRF's in the initial calibration. All other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 5/2/97 at 14:03 on instrument HP5 for the following compounds:

4-nitroaniline	26.1%
hexachloropropene	31.4%
hexachlorocyclopentadiene	54.0%

The non-detect results for these three compounds in associated sample 163HW00102 were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in deionized water blank GDKDW00102. This compound was not detected in sample 163HW00102. No action was necessary.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences in the field duplicate samples. No action was necessary.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory. All LCS Percent Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences in the field duplicate samples. No action was necessary.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required for this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the spreadsheets. Validated copies of the Form I's are included with the spreadsheets for this fraction of the SDG.

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All LCS Percent Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) TCL Compound Identification:

Herbicide Identification Summary (HIS):

All HIS Identification criteria were met. No action was required.

X.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not present on the spreadsheets. Copies of the Form I's were included with the spreadsheets for this fraction of the SDG.

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory. Three Percent Recoveries were below the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) TCL Compound Identification:

Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

X.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the spreadsheets. Copies of the Form I's are included with the spreadsheets for this fraction of the SDG.

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Field Blanks:

There were no positive detections in the three field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this fraction of the SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the

spreadsheets. Copies of the Form I's are included with the spreadsheets for this fraction of the SDG. All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

Field Blanks:

Gasoline Range Organics were not detected in the three field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the spreadsheets. Copies of the Form I's are included with the spreadsheets for this fraction of the SDG.

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the sample and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
FB	aluminum	104 ug/L	520 ug/L
FB	barium	0.64 ug/L	3.20 ug/L
CCB3	beryllium	0.10 ug/L	0.50 ug/L
FB	calcium	607 ug/L	3040 ug/L
CCB3	cobalt	1.20 ug/L	6.00 ug/L
FB	copper	8.10 ug/L	40.5 ug/L
FB	iron	46.9 ug/L	235 ug/L
FB	magnesium	26.5 ug/L	133 ug/L
FB	manganese	2.20 ug/L	11.0 ug/L
FB	nickel	5.40 ug/L	27.0 ug/L
ERB	potassium	162 ug/L	810 ug/L
ERB	sodium	1650 ug/L	8250 ug/L
CCB3	vanadium	0.80 ug/L	4.00 ug/L
ERB	zinc	63.9 ug/L	320 ug/L

CCB = Continuing Calibration Blank, ERB = Equipment Rinsate Blank (GDKEW00102),
FB = Field Blank (GDKFW00102)

All results for associated sample 163HW00102 greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, equipment rinsate or field blank were flagged as undetected (U). Negative results were not observed in the blanks for any analyte. No further action was required.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	5 ug/L
arsenic	4 ug/L
cadmium	2 ug/L
manganese	12 ug/L
sodium	11 ug/L
thallium	5 ug/L
vanadium	1 ug/L

These analytes should not be present. Since aluminum, calcium, iron nor magnesium was detected in the sample at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
cobalt	-5 ug/L
copper	-6 ug/L
nickel	-10 ug/L
selenium	-8 ug/L
silver	-5 ug/L
zinc	-453 ug/L

Since aluminum, calcium, iron nor magnesium was detected in the sample at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was necessary.

VIII.) Matrix Spike Recoveries (MS):

No MS sample was analyzed in this fraction of the SDG. No action was taken.

IX.) Field Duplicates:

Field duplicate samples 163HW00102 and 163GW00102 (analyzed in SDG 7566B) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	163HW00102, ug/L	163GW00102, ug/L	RPD
calcium	6940	6960	0.3%
iron	248	240	3.3%
manganese	17.7	17.7	0%

None of the RPD's exceeded the 30% QC limit for water samples, so no action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the spreadsheets. Validated copies of these Form I's are included with the spreadsheets for this fraction of the SDG.

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

The analytical results for field blanks GDKDW00102 and GDKFW00102 were not reported on the spreadsheets. Copies of the Form I's are included with the spreadsheets for this fraction of the SDG.

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7566B Level III, CLP Organics and Inorganics

SAMPLES: 161GW00102, 162GW00102, 162GW00202, 163GW00102, 166GW00102, 698GW00102, GDKGW00102, GDKGW00202, 163TW00102, 698TW00102, GDKTW00202, 163GW00102MS, 163GW00102MSD, GDKGW00102MS, GDKGW00102MSD, 161GW00102MS, 161GW00102MSD, 166GW00102MD, 166GW00102MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for acetone was 0.045 for the standard analyzed on 4/21/97 at 10:55 on instrument HP6, which was below the 0.050 QC limit. The non-detect results for acetone in the associated samples were rejected (R). The associated samples were 161GW00102, 166GW00102, 698GW00102 and trip blank 698TW00102.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 4/21/97 at 14:03 on instrument HP6 for the following compounds:

acetone	34.6%
2-butanone	30.0%

The non-detect results for 2-butanone in associated samples 161GW00102, 166GW00102 and 698GW00102 were flagged as estimated (UJ). The non-detect results for acetone in these three samples were previously rejected because of a low RRF in this calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

Acetone was detected at 6 ug/L in method blank VBW0421A. Since acetone was qualified based on the field blank, no action was required.

Field Blanks:

Acetone was detected at 2 ug/L and 7 ug/L, respectively, in deionized water blank GDKDW00102 and field blank GDKFW00102, which were analyzed in SDG 7566A. The detections of acetone in all SDG samples, which were less than 10X the blank amounts, were flagged as undetected (U) with the analytical results below the CRQL being raised to the CRQL.

Trip Blank:

Acetone was detected at 5 ug/L and 3 ug/L, respectively, in trip blanks 163TW00102 and 698TW00102. Acetone was previously qualified based on the field blank. No further action was taken.

Tentatively Identified Compounds (TIC):

TICs were not detected in the method, field and trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences in the field duplicate samples. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acetone were rejected in three samples because of a low RRF in the continuing calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) was 28.5% for 3,3'-dichlorobenzidine, which exceeded the 25% QC limit for the standard analyzed on 5/5/97 at 09:42 on instrument HP5. The non-detect result for this compound in associated sample 162GW00102 was flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was required.

Field Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in deionized water blank GDKDW00102, which was analyzed in SDG 7566A. The detection of this compound in associated sample 698GW00102, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL. There were no detections in the other two associated field blanks analyzed in SDG 7566A. No further action was necessary.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) for spiked samples 166GW00102MS and 166GW00102MSD exceeded the QC limits for the following compounds:

<u>Compound</u>	<u>RPD, %</u>	<u>QC Limit</u>
phenol	172	42%
2-chlorophenol	70	40%
4-chloro-3-methylphenol	142	42%

The non-detect results for 2-chlorophenol and 4-chloro-3-methylphenol in unspiked sample 166GW00102 were flagged as estimated (UJ). The non-detect result for phenol in this sample was rejected because of a low MSD %R (less than 10%). No further action was taken.

The Percent Recoveries (%R's) of spiked samples 166GW00102MS and 166GW00102MSD were outside the QC limits for the following compounds:

<u>Compound</u>	<u>MS, %</u>	<u>MSD, %</u>	<u>QC Limits</u>
phenol		5	12-110%
4-chloro-3-methylphenol		13	23-97%
4-nitrophenol	92		10-80%
pentachlorophenol		104	9-103%

The non-detect result for 4-chloro-3-methylphenol in unspiked sample 166GW00102 was flagged as estimated (UJ). The non-detect result for phenol was rejected (R) in this sample because the %R was less than 10%. Since 4-nitrophenol and pentachlorophenol were not detected in this sample, no further action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences in the two field duplicate samples. No action was necessary.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect result for phenol was rejected in sample 166GW00102 because of a very low Percent Recovery (less than 10%) in the MSD sample. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was required.

Field Blanks:

There were no detections in the three field blanks, analyzed in SDG 7566A. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) was 11.0% for endrin in both spiked samples 166GW00102MS and 166GW00102MSD, which was below the 56-121% QC limits. The non-detect result for endrin in unspiked sample 166GW00102 was flagged as estimated (UJ).

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences in the two field duplicate samples. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 7566A. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

Field Blanks:

Gasoline Range Organics were not detected in the three field blanks, which were analyzed in SDG 7566A. No action was necessary.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 147% for trifluorotoluene in sample 698GW00102, which exceeded the 75-125% QC limits. Since Gasoline Range Organics were not detected in this sample, no action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) TCL Compound Identification:

All criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
FB	aluminum	104 ug/L	520 ug/L
FB	barium	0.64 ug/L	3.20 ug/L
CCB3	beryllium	0.10 ug/L	0.50 ug/L
FB	calcium	607 ug/L	3040 ug/L
CCB3	cobalt	1.20 ug/L	6.00 ug/L
FB	copper	8.10 ug/L	40.5 ug/L
FB	iron	46.9 ug/L	235 ug/L
FB	magnesium	26.5 ug/L	133 ug/L
FB	manganese	2.20 ug/L	11.0 ug/L
FB	nickel	5.40 ug/L	27.0 ug/L
ERB	potassium	162 ug/L	810 ug/L
ERB	sodium	1650 ug/L	8250 ug/L
CCB3	vanadium	0.80 ug/L	4.00 ug/L
ERB	zinc	63.9 ug/L	320 ug/L

CCB = Continuing Calibration Blank, ERB = Equipment Rinsate Blank GDKFW00102,
FB = Field Blank GDKFW00102

ERB and FB were analyzed in SDG 7566A. All results in the associated samples greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, equipment rinsate or field blank were flagged as undetected (U). Negative results were not observed in the blanks for any analyte. No further action was required.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	5 ug/L
arsenic	4 ug/L
cadmium	2 ug/L
manganese	12 ug/L
sodium	11 ug/L
thallium	5 ug/L
vanadium	1 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
cobalt	-5 ug/L
copper	-6 ug/L
nickel	-10 ug/L
selenium	-8 ug/L
silver	-5 ug/L
zinc	-453 ug/L

Since neither calcium, iron, magnesium nor iron was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) were 21.8% and 21.4%, respectively, for iron and zinc in

duplicate sample 166GW00102MD, which exceeded the 20% QC limit. All positive and non-detect results for these two analytes in the SDG samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Recoveries (MS):

All MS Recovery criteria were met. No action was taken.

IX.) Field Duplicates:

One set of field duplicate samples, 163GW00102 / 163HW00102 (analyzed in SDG 7566A), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	163HW00102, ug/L	163GW00102, ug/L	RPD
calcium	6940	6960	0.3%
iron	248	240	3.3%
manganese	17.7	17.7	0%

None of the RPD's exceeded the 30% QC limit for water samples, so no action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0230
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide

SDG NUMBER: 29277 (Level III)

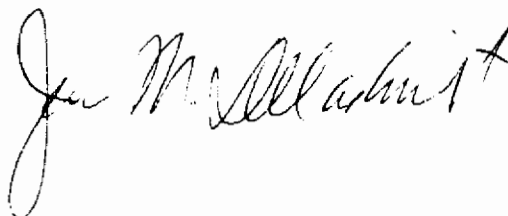
SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi- volatiles</u>	<u>Pesticides/ PCB's</u>	<u>Total Metals</u>	<u>Cyanide</u>
1665005D01	29277-02	Soil	X	X	X	X	X
1666005D01	29277-01	Soil	X	X	X	X	X
166E005D01	29277-03	Water	X	X	X	X	X
166T005D01	29277-04	Water	X				

1665005D01 = BENTONITE BLANK, 1666005D01 = SAND BLANK, E = EQUIPMENT RINSATE BLANK, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

J	-	The association numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 29277 Level III, CLP Organics and Inorganics

SAMPLES: 1665005D01, 1666005D01, 166E005D01, 166T005D01

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Chloroform was detected at 1 ug/L in water method blank VBLK1. Chloroform was not detected in the two associated field blank samples. No action was required

Equipment Rinsate Blank:

Chloroform was detected at 1 ug/L in equipment rinsate blank 166E005D01. Chloroform was not detected in the associated bentonite and sand blanks. No action was taken.

Trip Blank:

There were no detections in the trip blank. No action was necessary.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method, field and trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed by the laboratory. Five LCS Recoveries were outside the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 80 ug/kg in soil method blank SBLK2. Since the only two associated samples were the bentonite and sand blanks, no action was required.

Equipment Rinsate Blank:

There were no detections in the equipment rinsate blank. No action was necessary.

Tentatively Identified Compounds (TIC):

Several TIC's were detected in the method and equipment rinsate blanks. Since the only associated samples were the bentonite and sand blanks, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on the primary column on 5/15/97 exceeded the 20% QC limit for the following compounds:

alpha-BHC	28.1%
gamma-BHC	22.5%
delta-BHC	32.2%
aldrin	23.9%
dieldrin	27.2%
4,4'-DDD	22.3%

Since the only associated sample was the equipment rinsate blank, no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was required.

Equipment Rinse Blank:

There were no detections in the equipment rinsate blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

Four LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the two SDG samples:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Action Level</u>
EBW	aluminum	18.5 ug/L	18.5 mg/kg
PBS	barium	0.70 mg/kg	3.50 mg/kg
CCB3	beryllium	0.50 ug/L	0.50 mg/kg
PBW	lead	1.33 ug/L	1.33 mg/kg
EBW	potassium	350 ug/L	350 mg/kg
EBW	sodium	2760 ug/L	2760 mg/kg
CCB7	thallium	8.30 ug/L	8.30 mg/kg

CCB = Continuing Calibration Blank, EWB = Equipment Rinsate Blank GDKEW00102,
PBS = Preparation Blank (Soil), PBW = Preparation Blank (Water)

Since the only two associated samples were the bentonite and sand blanks, no action was required.

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB3	aluminum	-19.7 ug/L	19.7 mg/kg
ICB	arsenic	-3.40 ug/L	3.40 mg/kg
CCB9	iron	-48.1 ug/L	48.1 mg/kg
CCB7	manganese	-1.20 ug/L	1.20 mg/kg
PBS	potassium	-10.2 mg/kg	50.2 mg/kg
ICB	selenium	-2.50 ug/L	2.50 mg/kg
CCB1	tin	-4.70 ug/L	4.70 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBS = Preparation Blank (Soil)

Since the only two associated samples were the bentonite and sand blanks, no action was required.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were present in ICS Solution A at concentrations greater than the IDL:

antimony	8 ug/L
cadmium	1 ug/L
cobalt	2 ug/L
lead	3 ug/L
selenium	6 ug/L
sodium	20 ug/L
thallium	9 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-1 ug/L
arsenic	-4 ug/L
copper	-7 ug/L
manganese	-1 ug/L
nickel	-5 ug/L
potassium	-280 ug/L
zinc	-9 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

ICP Serial Dilution Analysis was not performed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Laboratory Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VIII.) Matrix Spike Recoveries (MS):

MS Recovery analysis was not performed in this SDG. No action was taken.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0232
CONTRACTED LAB: Southwest Laboratories, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPE OF ANALYSIS: Total Volatiles
SDG NUMBER: 29467 (Level III)

SAMPLES:

Client	Lab		Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Volatiles</u>
166GW0021A	29458.01	Water	X
166GW0031A	29485.03	Water	X
166GW0041A	29467.09	Water	X
166GW0051A	29467.14	Water	X
166GW0061A	29467.11	Water	X
166GW0071A	29467.04	Water	X
166GW0081A	29467.02	Water	X
166GW02D1A	29485.02	Water	X
166GW03D1A	29485.04	Water	X
166HW03D1A	29485.05	Water	X
166GW04D1A	29467.08	Water	X
166GW05D1A	29467.13	Water	X
166GW06D1A	29467.10	Water	X
166GW07D1A	29467.03	Water	X
166GW07D1ADL	29467.03DL	Water	+
166GW08D1A	29467.01	Water	X
166GW09D1A	29467.12	Water	X
166GW10D1A	29467.05	Water	X
166GW10D1ADL	29467.05DL	Water	+
166GW11D1A	29467.06	Water	X
166GW12D1A	29467.07	Water	X

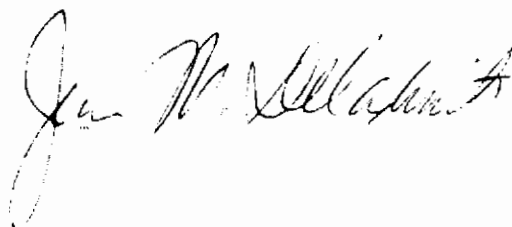
Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Total Volatiles</u>
166TW0051A	29467.15	Water	X
166TW03D1A	29485.06	Water	X
166GW08D1AMS	29467.01MS	Water	+
166GW08D1AMSD	29467.01MSD	Water	+

+ = Non-billable analysis

DL = DILUTION, H = FIELD DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

J	-	The associated numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 29467 CLP Organics

SAMPLES: 166GW0021A, 166GW0031A, 166GW0041A, 166GW0051A, 166GW0061A, 166GW0071A, 166GW0081A, 166GW02D1A, 166GW03D1A, 166HW03D1A, 166GW04D1A, 166GW05D1A, 166GW06D1A, 166GW07D1A, 166GW07D1ADL, 166GW08D1A, 166GW09D1A, 166GW10D1A, 166GW10D1ADL, 166GW11D1A, 166GW12D1A, 166TW0051A, 166TW03D1A, 166GW08D1AMS, 166GW08D1AMSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/12/97 on instrument N for the following compounds:

acetone	30.1%
2-butanone	35.5%

There were no positive results for these compounds in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 5/28/97 at 17:37 on instrument N for carbon disulfide (44.6%). The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GW0021A, 166GW02D1A, 166GW0031A, 166GW03D1A and 166HW03D1A.

IV.) Blanks:

Method Blanks:

1,1,2,2-Tetrachloroethane was detected at 1 ug/L in method blank VBLK2. There were no positive results for this compound in the associated samples. No action was required.

Trip Blanks:

There were no positive detections in the trip blanks. No action was required.

Tentatively Identified Compounds (TIC):

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. One LCS Recovery exceeded the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The results for trichloroethene exceeded the linear range for samples 166GW07D1A and 166GW10D1A. These samples were diluted and reanalyzed. The dilution results for trichloroethene were inserted into the original analysis data by the validator.

All other CRQL criteria were met. No further action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0233
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRIX: Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 29387 (Level III)

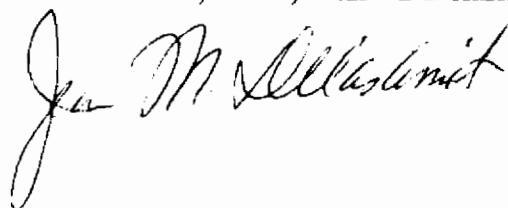
SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
694GW00101	29401.01	Water	X
694GW00201	29401.03	Water	X
694GW00301	29401.02	Water	X
694GW00401	29387.02	Water	X
694GW00501	29387.01	Water	X
694GW00601	29387.03	Water	X
694GW00701	29387.04	Water	X
694HW00701	29387.05	Water	X
694FW00201	29401.04	Water	X

F = FIELD BLANK, H = FIELD DUPLICATE

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 29387 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 694GW00101, 694GW00201, 694GW00301, 694GW00401, 694GW00501,
694GW00601, 694GW00701, 694HW00701, 694FW00201

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

OCDD was detected in method blank at the following concentration:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>5X Action Level</u>
DFBLK1	OCDD	2.5 pg/L	13 pg/L

Detections of this compound in the associated samples below 5X the blank amount were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Field blank 694FW00201 collected on 5/16/97 was analyzed in this SDG. Two 2,3,7,8-substituted PCDD's and PCDF's were detected in the blank at the following concentrations:

<u>Field Blank ID</u>	<u>Compound</u>	<u>Conc.</u>	<u>5X Action Level</u>
694FW00201	OCDD	8.9 pg/L	45 pg/L
694FW00201	1234678-HpCDF	1.7 pg/L	8.5 pg/L

Detections of these compound in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

Field duplicates set 694GW00701 / 694HW00701 was analyzed by the laboratory. There were no calculable Relative Percent Differences (RPD's) for the set of field duplicate samples, so no action was required.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" flags meaning "EMPC" were replaced with "EMPC" upon validation.

VALIDATA

Chemical Services, Inc.

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(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0236
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level III, Appendix IX
EPA METHODS: EPA SOW 3-90, SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organic Compounds, Semivolatile Organic Compounds, Pesticides / PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Total Recoverable Petroleum Hydrocarbons - Diesel Range Organics (TRPH-DRO), Total Recoverable Petroleum Hydrocarbons - Gasoline Range Organics (TRPH-GRO), Total Metals, Cyanide, Hexavalent Chromium

SDG NUMBER: 7669 (Level III)

Client	Lab	Volatile	Semi-	Pesticides/	Organophos.	Chlorinated	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Pesticides</u>	<u>Herbicides</u>
1664010D01	7669.04	Soil	X	X	X		
1664010D01RE	7669.04RE	Soil			+		
694GW00101	7681.01	Water	X	X	X	X	X
694GW00201	7681.03	Water	X	X	X	X	X
694GW00201RE	7681.03RE	Water		+			
694GW00301	7681.02	Water	X	X	+	X	X
694GW00301RE	7681.02RE	Water		+	X		
694GW00401	7676.02	Water	X	X	X	X	X
694GW00401RE	7676.02RE	Water		+			
694GW00501	7676.01	Water	X	X	X	X	X
694GW00601	7676.03	Water	X	X	X	X	X
694GW00701	7669.01	Water	X	X	X	X	X
694GW00701RE	7669.01RE	Water		+	+		
694HW00701	7669.02	Water	X	X	X	X	X
694HW00701RE	7669.02RE	Water		+	+		
694FW00201	7681.04	Water	X	X	X	X	X
694FW00201RE	7681.04RE	Water		+			

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Organophos. Pesticides	Chlorinated Herbicides
694TW00201	7681.05	Water	X				
694TW00601	7676.04	Water	X				
694TW00701	7669.03	Water	X				
1664010D01MS	7669.04MS	Soil	+				
1664010D01MSD	7669.04MSD	Soil	+				
694GW00701MS	7669.01MS	Water	+				
694GW00701MSD	7669.01MSD	Water	+				

Client Sample #	Lab Sample #	Matrix	TRPH- DRO	TRPH- GRO	Total Metals	Cyanide	Hexavalent Chromium
1664010D01	7669.04	Soil	X	X	X	X	
694GW00101	7681.01	Water	X	X	X	X	X
694GW00201	7681.03	Water	X	X	X	X	X
694GW00301	7681.02	Water	X	X	X	X	X
694GW00401	7676.02	Water	X	X	X	X	X
694GW00501	7676.01	Water	X	X	X	X	X
694GW00601	7676.03	Water	X	X	X	X	X
694GW00701	7669.01	Water	X	X	X	X	X
694HW00701	7669.02	Water	X	X	X	X	X
694FW00201	7681.04	Water	X	X	X	X	X
694FW00201MS	7681.04MS	Water	+				+
694FW00201MD	7681.04MD	Water					+
694FW00201MSD	7681.04MSD	Water	+				
694GW00101MS	7681.01MS	Water		+			
694GW00101MSD	7681.01MSD	Water		+			
694GW00501MS	7676.01MS	Water					+
694GW00501MD	7676.01MD	Water					+
694HW00701MS	7669.02MS	Water					+
694HW00701MD	7669.02MD	Water					+

MATRIX CODES (4th Digit of Client Sample #):

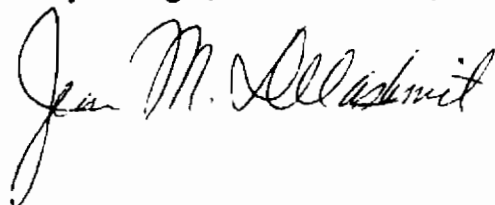
F = FIELD BLANK, H = FIELD DUPLICATE, T = TRIP BLANK, 4 = GROUT BLANK

SUFFIX CODES:

MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 7669 CLP Organics and Inorganics

SAMPLES: 1664010D01, 1664010D01RE, 694GW00101, 694GW00201, 694GW00201RE, 694GW00301, 694GW00301RE, 694GW00401, 694GW00401RE, 694GW00501, 694GW00601, 694GW00701, 694GW00701RE, 694HW00701, 694HW00701RE, 694FW00201, 694FW00201RE, 694TW00201, 694TW00601, 694TW00701, 1664010D01MS, 1664010D01MSD, 694GW00701MS, 694GW00701MSD, 694FW00201MS, 694FW00201MD, 694FW00201MSD, 694GW00101MS, 694GW00101MSD, 694GW00501MS, 694GW00501MD, 694HW00701MS, 694HW00701MD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors were below the 0.050 QC limit for the standards analyzed on 5/19/97 on instrument HP6 for the following compounds:

acrolein	0.012
acrylonitrile	0.033
propionitrile	0.012
acetonitrile	0.015
1,4-dioxane	0.003
isobutyl alcohol	0.010

The results for these compounds in the associated samples, trip blanks and field blank, which consisted entirely of non-detects, were rejected (R). The associated samples and blanks were 694TW00701, 694GW00701, 694HW00701, 694TW00601, 694GW00501, 694GW00401, 694GW00601, 694TW00201, 694GW00301, 694GW00201, 694FW00201 and 694GW00101.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 5/19/97 on instrument HP6 for acetone (50.9%). All positive results for this compound in the

associated samples were flagged as estimated (J). The associated samples were 694GW00701, 694HW00701, 694GW00501, 694GW00401, 694GW00601, 694GW00301, 694GW00201 and 694GW00101.

The Average Relative Response Factors were below the 0.050 QC limit for the standards analyzed on 5/20/97 on instrument HP6 for the following compounds:

acrolein	0.012
acrylonitrile	0.041
propionitrile	0.016
acetonitrile	0.019
1,4-dioxane	0.004
isobutyl alcohol	0.014

The results for these compounds in associated grout blank 1664010D01, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 5/20/97 on instrument HP6 for acetone (30.2%). The positive result for this compound in associated blank 1664010D01 was not flagged since this was a blank.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blank:

Acetone and 2-butanone were detected at 10 ug/L and 3 ug/L, respectively, in field blank 694FW00201. There were no positive results for 2-butanone in the associated samples. All positive results for acetone in the associated samples were flagged based on the trip blanks. No further action was taken.

Trip Blanks:

Acetone was detected at 3 ug/L in trip blank 694TW00201. The positive results for this compound in associated samples 694GW00101, 694GW00201 and 694GW00301, which were less than 10X the blank amount, were flagged as undetected (U), with analytical result less than the CRQL being replaced with the CRQL.

Acetone was detected at 2 ug/L in trip blank 694TW00601. The positive results for this compound in the associated samples, which were less than 10X the blank amount, were flagged as undetected (U), with analytical result less than the CRQL being replaced with the CRQL. The associated samples were 694GW00401, 694GW00501, 694GW00601, 694GW00701 and 694HW00701.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. Several LCS Recoveries exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 694GW00701 and 694HW00701. No action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The results for grout blank 1664010D01 were reported on the spreadsheets and on the Form I's as a water sample (ug/L). The MS/MSD set for this sample was also reported on the Form I's as a water sample. The Chain-of-Custody form and all other fractions of the data package identified this sample as a soil matrix (grout blank). The matrix and concentration units were corrected by the validator.

to be "soil" and "ug/kg". The laboratory should verify the quantification limits for non-detect results.

All non-detect results for acrolein, acrylonitrile, propionitrile, acetonitrile, 1,4-dioxane and isobutyl alcohol in the samples in this SDG were rejected because of low relative response factors in the initial calibrations. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 6/11/97 on instrument HP1 for the following compounds:

4-nitroquinoline-1-oxide	0.045
hexachlorophene	0.027

The non-detect results for these compounds in associated samples 694GW00601, 694GW00101 and 694GW00301 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 6/11/97 on instrument HP1 for the following compounds:

4-nitroquinoline-1-oxide	48.3%
hexachlorophene	56.8%

The results for these compounds in the associated samples were previously rejected. No further action was required.

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 6/10/97 on instrument HP5 for the following compounds:

pentachloronitrobenzene	0.040
kepone	0.029
hexachlorophene	0.028

The non-detect results for these compounds in associated blank 1664010D01 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 6/10/97 on instrument HP5 for the following compounds:

hexachlorophene	59.9%
3,3'-dimethylbenzidine	34.4%
methapyrilene	39.4%

There were no positive results for these compounds in the associated samples. No action was required.

The Average Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 5/21/97 on instrument HP7 for hexachlorophene (0.004). The non-detect result for this compound in the associated field blank 694FW00201 was rejected.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/21/97 on instrument HP7 for the following compounds:

2,4-dinitrophenol	36.0%
hexachlorophene	77.6%
3,3'-dimethylbenzidine	36.5%

No action was required, since the associated sample was a field blank.

Continuing Calibration:

The Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 6/12/97 at 10:42 on instrument HP1 for 4-nitroquinoline-1-oxide (0.048). The non-detect results for this compound in the associated samples were previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/12/97 at 10:42 on instrument HP1 for the following compounds:

pyridine	25.4%
aniline	70.6%
benzyl alcohol	33.9%
2,4-dinitrophenol	26.5%
4-nitroaniline	29.2%
4,6-dinitro-2-methylphenol	25.6%
pentachlorophenol	26.3%
di-n-butylphthalate	25.1%
1-naphthylamine	45.4%
2-naphthylamine	38.3%
thionazin	43.0%
phorate	32.5%
sulfotepp	29.2%
phenacetin	31.4%
dimethoate	39.1%
methyl parathion	47.2%
parathion	32.1%

kepone	32.0%
1,4-naphthoquinone	32.0%

All positive and non-detect results for these compounds in the associated samples were flagged as estimated (J) and (UJ). The associated samples were 694GW00601, 694GW00101 and 694GW00301.

The Relative Response Factors (RRFs) were below the 0.050 QC limit for the standards analyzed on 6/11/97 at 03:24 on instrument HP5 for the following compounds:

pentachloronitrobenzene	0.042
kepone	0.025
hexachlorophene	0.023

The results for these compounds in the associated sample were previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/11/97 at 03:24 on instrument HP5 for the following compounds:

pyridine	25.6%
azobenzene	28.0%
3,3'-dimethylbenzidine	27.5%

No action was taken since the only associated sample was grout blank 1664010D01.

The Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 5/28/97 at 12:19 on instrument HP7 for hexachlorophene (0.003). The results for this compound in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 694GW00501, 694GW00401, 694GW00701, 694HW00701 and 694GW00201.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 5/28/97 at 12:19 on instrument HP7 for the following compounds:

benzoic acid	42.9%
2,4-dinitrophenol	71.7%
4-nitroaniline	28.6%
4,6-dinitro-2-methylphenol	40.8%
carbazole	34.9%
3,3'-dimethylbenzidine	38.1%
3,3'-dichlorobenzidine	33.2%
n-nitrosopiperidine	49.8%
1-naphthylamine	27.4%
diallate	49.0%
4-aminobiphenyl	30.1%
methapyrilene	33.8%
kepone	26.2%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were

flagged as estimated (UJ). The associated samples were 694GW00501, 694GW00401, 694GW00701, 694HW00701 and 694GW00201.

IV.) Blanks:

Method Blanks:

Benzoic acid was detected at 10 ug/L in method blank EBS0528. There were no positive results for this compound in the associated samples. No action was required.

Field Blank:

There were no positive detections in the field blank. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) was 39% for 2-fluorobiphenyl in sample 694GW00101, which was below the 43-116% QC limits. Since only one surrogate was outside the QC limits in the base/neutral fraction, no action was required.

The Percent Recovery (%R) was 27% for terphenyl-d14 for sample 694GW00601, which was below the 33-141% QC limits. Since only one surrogate was outside the QC limits in the base/neutral fraction, no action was required.

The Percent Recoveries (%R's) were below their respective QC limits for sample 694GW00501 for the following surrogate compounds:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
nitrobenzene-d5	0%	34-114%
2-fluorobiphenyl	8%	43-116%
terphenyl-d14	27%	33-141%
1,2-dichlorobenzene-d4	0%	16-110%

All base/neutral compound results for this sample, which consisted entirely of non-detects, were rejected (R), since three %R's were less than 10%. This sample was not re-analyzed by the laboratory.

The Percent Recoveries (%R's) were below their QC limits for sample 694FW00201 for the following surrogate compounds:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
nitrobenzene-d5	20%	34-114%
2-fluorobiphenyl	18%	43-116%
terphenyl-d14	15%	33-141%
phenol-d5	0%	10-94%

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
2-fluorophenol	0%	21-100%
2,4,6-tribromophenol	0%	10-123%
2-chlorophenol-d4	0%	33-110%

All acid compound results for this sample, which consisted entirely of non-detects, were rejected (R), since all four surrogate %R's were less than 10%. No further action was taken, since the sample is a field blank.

The Percent Recoveries (%R's) were below their QC limits for sample 694GW00401 for the following surrogate compounds:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
nitrobenzene-d5	22%	35-114%
2-fluorobiphenyl	26%	43-116%
terphenyl-d14	27%	33-141%

All positive and non-detect results for the base-neutral fraction of this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) were below their QC limits for sample 694GW00701 for the following surrogate compounds:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
2-fluorobiphenyl	34%	43-116%
terphenyl-d14	30%	33-141%

All positive and non-detect results for the base-neutral fraction of this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) were below their QC limits for sample 694HW00701 for the following surrogate compounds:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
2-fluorobiphenyl	34%	43-116%
terphenyl-d14	32%	33-141%

All positive and non-detect results for the base-neutral fraction of this sample were flagged as estimated (J) and (UJ).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. Several LCS Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate samples in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 694GW00201, 694GW00301, 694GW00401, 694GW00701, 694HW00701 and field blank 694FW00201 were considered by the validator to be of preferable data quality as compared to the reanalyses because of better surrogate recoveries and holding times.

The non-detect results for hexachlorophene were rejected in all samples and blanks in this SDG based on low Relative Response Factors in the initial and continuing calibrations. The non-detect results for 4-nitroquinoline-1-oxide were rejected in samples 694GW00101, 694GW00301 and 694GW00601 because of a low Relative Response Factor in the initial calibration. The non-detect results for pentachloronitrobenzene and kepone were rejected in blank 1664010D01 because of low Relative Response Factors in the initial calibration. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blank:

There were no positive detections in the field blank. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of the dicachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) surrogates were below the 30-150% QC limits for the following samples and blank:

Client Sample #	TCX, %R Column 1	TCX, %R Column 2	DCB, %R Column 1	DCB, %R Column 2
694GW00701			22.5	26.6
694HW00701			29.8	
694GW00501			27.4	
694GW00601			25.0	
694GW00301RE			23.8	
1664010D01	28.6	27.9		

All positive and non-detect results for the five samples were flagged as estimated (J) and (UJ). No action was required for grout blank 1664010D01.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

The original analyses of blank 1664010D01 and samples 694GW00701 and 694HW00701 were considered by the validator to be of preferable data quality as compared to the reanalyses because of better holding times. The reanalysis of sample 694GW00301 was considered by the validator to be of preferable data quality because of improved surrogate recoveries. All laboratory data were acceptable with qualifications.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for standard run CCALA4X01 on the secondary column on 5/21/97 for the following compounds:

phorate	27.1%
disulfoton	28.2%
m-parathion	39.0%

The results for these compounds in all samples in this SDG, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for standard run CCALA4X02 on the

secondary column on 5/21/97 for the following compounds:

phorate	30.1%
disulfoton	31.2%
m-parathion	41.9%

The results for these compounds in all samples in this SDG were previously flagged based on the standard run CCALA4X01. No further action was required.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was required.

Field Blank:

There were no detections in the field blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. no action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was required.

Field Blank:

There were no detections in the field blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (TRPH-DRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Field Blank:

There were no positive detections in the field blank. No action was necessary.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate samples in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS
(TRPH-GRO)*

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was necessary.

Field Blank:

There were no detections in the field blank. No action was necessary.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate samples in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Levels	
			ug/L	mg/kg
694FW0201	aluminum	137 ug/L	685	137
CCB3	antimony	2.40 ug/L	12.0	2.40
694FW00201	barium	1.40 ug/L	7.00	1.40
PBW	beryllium	0.55 ug/L	2.75	0.55
CCB3	cadmium	0.30 ug/L	1.50	0.30
694FW00201	calcium	109 ug/L	545	109
694FW00201	iron	105 ug/L	525	105
694FW00201	magnesium	72.3 ug/L	362	72.3
694FW00201	manganese	8.60 ug/L	43.0	8.60
PBW	potassium	16.5 ug/L	82.5	16.5
CCB3	selenium	4.40 ug/L	22.0	4.40
CCB2	sodium	295 ug/L	1475	295
694FW00201	zinc	23.0 ug/L	115	23.0

CCB = Continuing Calibration Blank, FW = Field Blank, PBW= Preparation Blank (Water)

All sample results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water samples, mg/kg for soil samples) for which the contaminated blank was an associated calibration, preparation or field blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.	
			ug/L	mg/kg
CCB3	chromium	-1.90 ug/L	9.50	1.90
CCB3	cobalt	-2.40 ug/L	12.0	2.40
PBW	copper	-2.27 ug/L	11.3	2.27
CCB3	nickel	-2.00 ug/L	10.0	2.00

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met. No action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	4 ug/L
arsenic	5 ug/L
beryllium	1 ug/L
cadmium	3 ug/L
lead	3 ug/L
manganese	7 ug/L
sodium	1150 ug/L
tin	37 ug/L
zinc	2 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
chromium	-4 ug/L
cobalt	-6 ug/L
copper	-8 ug/L
nickel	-10 ug/L
potassium	-97 ug/L
selenium	-3 ug/L
silver	-6 ug/L
vanadium	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) for calcium (12.5%), iron (14.7%) and manganese (11.1%) in serial dilution sample 694GW00701L exceeded the 10% QC limit. All positive results for these analytes in the associated water samples were flagged as estimated (J).

The Percent Differences (%D's) for beryllium (27.4%), potassium (26.0%) and zinc (17.0%) in serial dilution sample 1664010D01L exceeded the 10% QC limit. No action was taken since the only associated soil sample was the grout blank.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

Analyte	694GW00701, ug/L	694HW00701, ug/L	RPD
barium	32.5	34.0	4.5%
calcium	254000	258000	1.6%
iron	3630	4650	25%
magnesium	357000	358000	0.3%
manganese	1320	1340	1.5%
potassium	110000	110000	0%
selenium	5.6	5.0	11%
sodium	2960000	2990000	1.0%
vanadium	0.97	1.3	29%

Since all of the RPD's were within the 30% QC limit for water samples, no action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM

I.) Holding Times:

All holding Time criteria were met. No action was required.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was required.

Field Blank:

There were no detections in the field blank. No action was required.

IV.) Laboratory Check Samples (LCS):

There were no LCS's analyzed with this SDG. No action was taken.

V.) Laboratory Duplicate Analysis (MD):

All MD criteria were met. No action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS criteria were met. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for hexavalent chromium was not calculable for the pair of field duplicate samples in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0251
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRIX: Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBER: 30186 (Level III)

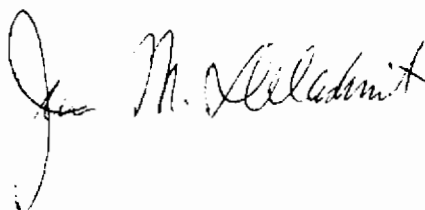
SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
694GW00102	30186.07	Water	X
694GW00202	30186.05	Water	X
694GW00302	30186.04	Water	X
694GW00402	30211.01	Water	X
694GW00502	30186.01	Water	X
694GW00602	30186.06	Water	X
694GW00702	30186.02	Water	X
694HW00702	30186.03	Water	X

H = FIELD DUPLICATE

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 30186 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 694GW00102, 694GW00202, 694GW00302, 694GW00402, 694GW00502,
694GW00602, 694GW00702, 694HW00702

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

There were no 2,3,7,8-substituted PCDD's and PCDF's detected in the method blank for this SDG. No action was required.

Field Blanks:

No field blank was analyzed in this SDG. No action was taken.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

Field duplicates set 694GW00702 / 694HW00702 was analyzed. The only calculable Relative Percent Difference (RPD) was:

<u>Compound</u>	<u>694GW00702</u>	<u>694HW00702</u>	<u>RPD</u>
OCDD	15.3 pg/L	37.4 pg/L	83.9%

The RPD for OCDD exceeded the 30% QC limit for water samples. The positive results for this compound in the two field duplicate samples were flagged as estimated (J).

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" flags meaning "Estimated Maximum Possible Concentration" were replaced with "EMPC" upon validation.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0255
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide

SDG NUMBER: 7942 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
166GW00103	7962-01	Water	X	X	X	X	X
694GW00102	7942-07	Water	X	X		X	X
694GW00202	7942-05	Water	X	X		X	X
694GW00302	7942-04	Water	X	X		X	X
694GW00402	7947-01	Water	X	X		X	X
694GW00502	7942-01	Water	X	X		X	X
694GW00602	7942-06	Water	X	X		X	X
694GW00702	7942-02	Water	X	X		X	X
694HW00702	7942-03	Water	X	X		X	X
166DW00103	7962-02	Water	X	X	X	X	X
166EW00103	7962-03	Water	X	X	X	X	X
166FW00103	7962-04	Water	X	X	X	X	X
166TW00103	7962-05	Water	X				
694TW00102	7942-08	Water	X				
694TW00402	7947-02	Water	X				
694GW00502MS	7942-01MS	Water	+				
694GW00502MSD	7942-01MSD	Water	+				
694GW00402MS	7947-01MS	Water	+				

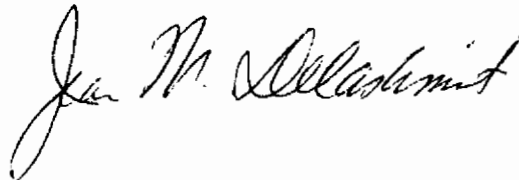
Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
694GW00402MSD	7947-01MSD	Water	+				
166DW00103MD	7962-02MD	Water				+	+
166DW00103MS	7962-02MS	Water				+	+
166FW00103MD	7962-04MD	Water				+	+
166FW00103MS	7962-04MS	Water				+	+

+ = Non-billable analysis

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD BLANK, HW = FIELD DUPLICATE, MD = MATRIX DUPLICATE,
MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, TW = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7942 CLP Organics and Inorganics

SAMPLES: 166GW00103, 694GW00102, 694GW00202, 694GW00302, 694GW00402, 694GW00502, 694GW00602, 694GW00702, 694HW00702, 166DW00103, 166EW00103, 166FW00103, 166TW00103, 694TW00102, 694TW00402, 694GW00502MS, 694GW00502MSD, 694GW00402MS, 694GW00402MSD, 166DW00103MS, 166DW00103MD, 166FW00103MS, 166FW00103MD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Acetone was detected at 2 ug/L in water method blank VBW0731A. Since the only associated samples were field blanks, no action was required.

Field Blanks:

Chloroform was detected at 9 ug/L, 8 ug/L and 8 ug/L, respectively, in deionized water blank 166DW00103, equipment rinsate blank 166EW00103 and field blank 166FW00103. Chloroform was not detected in the SDG samples. No action was required. In addition, acetone was detected at 3 ug/L in the field blank. All detections of this compound in the associated SDG samples, which were less than 10X the blank amount, were flagged as undetected (U) with the analytical results below the CRQL being replaced with the CRQL.

Trip Blank:

There were no detections in the three trip blanks. No action was necessary.

Tentatively Identified Compounds (TIC):

TIC's were not detected in any SDG sample. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

One pair of field duplicate samples (694GW00702 / 694HW00702) was analyzed in this SDG. There were no calculable Relative Percent Differences (RPD's) for this pair. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) were 33.0% and 29.9%, respectively, for bis(2-chloroethyl)ether and benzo(k)fluoranthene in the standard analyzed on 7/31/97 at 18:27 on instrument HP7, which exceeded the 25% QC limit. The non-detect results for these two compounds in associated sample 694GW00602 were flagged as estimated (UJ).

The Percent Difference (%D) was 26.9% for pyridine in the standard analyzed on 8/1/97 at 19:20 on instrument HP7, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample 166GW00103 was flagged as estimated (UJ).

The Percent Differences (%D's) were 27.6%, 27.7% and 25.8%, respectively, for 4-nitrophenol, di-n-butylphthalate and benzo(g,h,i)perylene in the standard analyzed on 8/18/97 at 20:06 on instrument HP5, which exceeded the 25% QC limit. The non-detect results for these three compounds in associated samples 694GW00102 and 694GW00202 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Diethylphthalate was detected at 35 ug/L in method blank SBLKAA. The detection of this compound in associated sample 694GW00402, which was less than 10X the blank amount, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample.

Field Blanks:

Benzoic acid was detected at 1 ug/L in field blank 166FW00103. 2,4,6-Trichlorophenol was detected at 1 ug/L each in deionized water blank 166DW00103 and field blank 166FW00103. Since there were no detections of these compounds in the SDG samples, no action was required.

Di-n-butylphthalate was detected at 1 ug/L in equipment rinsate blank 166EW00103. The detections of this compound in associated samples 694GW00202, 694GW00402 and 694GW00602, which were less

than 10X the blank amount, were flagged as undetected (U) with the analytical results below the CRQL being raised to the CRQL. The detections of this compound in samples 694GW00502 and 694HW00702 were greater than 10X the blank amount. No further action was taken.

Tentatively Identified Compounds (TIC):

4-Hydroxy-4-methyl-2-pentanone was detected in method blank VBLKAC at a sufficient concentration to eliminate, by applying the 5X Action Limit Rule, the detection in sample 166GW00103. Since data validation action based on blank TIC's was not required, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed by the laboratory. Five LCS recoveries were outside the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

One pair of field duplicate samples (694GW00702 / 694HW00702) was analyzed in this SDG. There were no calculable Relative Percent Differences (RPD's) for this pair. No action was necessary.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticides Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration were met. No action was required.

IV.) Blanks:

There were no positive detections in the method or field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

IX.) Field Duplicates:

No field duplicate samples were associated with this fraction of the SDG. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All Florisil Cartridge Check criteria were met. No action was necessary.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All criteria were met. No action was required.

XII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Action Level</u>
ERB	aluminum	45.6 ug/L	228 ug/L
DWB	antimony	3.00 ug/L	15.0 ug/L
ERB	barium	0.54 ug/L	2.70 ug/L
CCB4	beryllium	0.50 ug/L	2.50 ug/L
CCB4	calcium	131 ug/L	655 ug/L
CCB4	chromium	2.10 ug/L	10.5 ug/L
CCB4	cobalt	1.90 ug/L	9.50 ug/L
CCB4	copper	1.40 ug/L	7.00 ug/L
CCB4	magnesium	8.20 ug/L	41.0 ug/L
CCB4	nickel	1.80 ug/L	9.00 ug/L
CCB4	silver	2.10 ug/L	10.5 ug/L
ERB	sodium	826 ug/L	4130 ug/L
CCB4	thallium	6.40 ug/L	32.0 ug/L
ERB	zinc	31.0 ug/L	155 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (166DW00103),
ERB = Equipment Rinsate Blank (166EW00103)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, deionized water or equipment rinsate blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank</u> <u>Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
PBW	arsenic	-3.18 ug/L	15.9 ug/L
PBW	calcium	-29.5 ug/L	148 ug/L
PBW	chromium	-0.69 ug/L	3.45 ug/L
PBW	cobalt	-1.49 ug/L	7.45 ug/L
PBW	nickel	-1.04 ug/L	5.20 ug/L
CCB8	potassium	-83.4 ug/L	417 ug/L
CCB2	silver	-1.50 ug/L	7.50 ug/L
CCB3	sodium	-26.4 ug/L	132 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
arsenic	4 ug/L
cadmium	4 ug/L
manganese	5 ug/L
sodium	135 ug/L
zinc	7 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-5 ug/L
barium	-2 ug/L
chromium	-4 ug/L
cobalt	-2 ug/L
copper	-6 ug/L
nickel	-6 ug/L

potassium	-124 ug/L
selenium	-9 ug/L
silver	-3 ug/L
thallium	-7 ug/L
tin	-64 ug/L
vanadium	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

All MS Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

One pair of field duplicate samples (694GW00702 / 694HW00702) was analyzed in this SDG. The calculable Relative Percent Differences were:

<u>Compound</u>	<u>694GW00702</u>	<u>694HW00702</u>	<u>RPD</u>
calcium	280000 ug/L	246000 ug/L	13%
iron	5400 ug/L	4660 ug/L	15%
magnesium	346000 ug/L	307000 ug/L	12%
manganese	1460 ug/L	1290 ug/L	12%
potassium	1730000 ug/L	109000 ug/L	45%
sodium	3340000 ug/L	3300000 ug/L	1.2%

The RPD for potassium exceeded the 30% QC limit for water samples. The detections of potassium in the two field duplicate samples were flagged as estimated (J). Since all other RPD's met the 30% QC criterion, no further action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0257
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994
SAMPLE MATRICES: Sediment and Soil
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide, Organotin, Hexavalent Chromium
SDG NUMBER: 7954 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
695M000101	7954-02	Sediment	X	X	X	X	X
695M000201	7954-01	Sediment	X	X	X	X	X
695TM00101	7954-03	Soil	X				
695M000201MD	7954-01MD	Sediment				+	
695M000201MS	7954-01MS	Sediment	+			+	
695M000201MSD	7954-01MSD	Sediment	+				
695M000101MD	7954-02MD	Sediment					+
695M000101MS	7954-02MS	Sediment					+

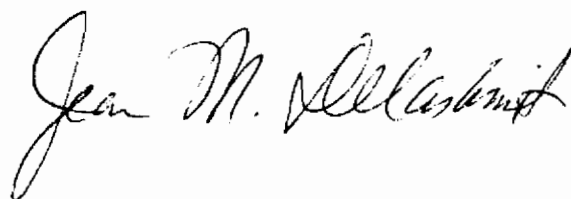
Client Sample #	Lab Sample #	Matrix	Organotin	Hexavalent Chromium
695M000102	7954-02	Sediment	X	X
695M000201	7954-01	Sediment	X	X
695M000201MD	7954-01MD	Sediment		+
695M000201MS	7954-01MS	Sediment		+

+ = Non-billable analysis

MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
TW = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, reading "Jean M. Delashmit". The signature is written in a cursive style with a large, stylized "J" and "M".

Data Qualifier Definitions

- | | | |
|----|---|---|
| J | - | The associated numerical value is an estimated quantity. |
| R | - | The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification. |
| U | - | The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit. |
| UJ | - | The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity. |

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7954 CLP Organics and Inorganics

SAMPLES: 695M000101, 695M000201, 695TM00101, 695M000201MD, 695M000201MS,
695M000201MSD, 695M000101MD, 695M000101MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Acetone was detected at 2 ug/kg in soil method blank VBS0724B. Since the trip blank was used for blank qualifications, no action was required.

Trip Blank:

Acetone was detected at 22 ug/kg in trip blank 695TM00101. The detections of acetone in samples 695M000101 and 695M000201, which were less than 10X the blank amount, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample.

Tentatively Identified Compounds (TIC):

TIC's were not detected in any SDG sample. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) was 26.7% for pyridine in the standard analyzed on 8/1/97 at 19:20 on instrument HP7, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample 695M000201 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Diethylphthalate, benzoic acid and di-n-butylphthalate were detected at 180 ug/kg, 60 ug/kg and 71 ug/kg, respectively, in soil method blank SBLKAA. The detections of diethylphthalate and di-n-butylphthalate in associated sample 695M000101, which were less than 10X the blank amounts, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample. Benzoic acid was not detected in the sample. No further action was taken.

Diethylphthalate and di-n-butylphthalate were detected at 200 ug/kg and 51 ug/kg, respectively in soil method blank SBLKAB. The detections of diethylphthalate and di-n-butylphthalate in associated sample 695M000201, which were less than 10X the blank amounts, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample.

Tentatively Identified Compounds (TIC):

4-Hydroxy-4-methyl-2-pentanone was detected in the method blanks at sufficient concentrations to eliminate, by applying the 5X Action Limit Rule, the detection in both SDG samples. Since data validation action based on blank TIC's was not required, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed by the laboratory. Two LCS recoveries exceeded the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticides Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All Florisil Cartridge Check criteria were met. No action was necessary.

Gel Permeation Chromatography (GPC):

All GPC Cleanup criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All criteria were met. No action was required.

XII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Action Level</u>
CCB3	aluminum	56.8 ug/L	56.8 mg/kg
PBS	barium	0.07 mg/kg	0.35 mg/kg
CCB2	beryllium	0.40 ug/L	0.40 mg/kg
ICB	cadmium	0.20 ug/L	0.20 mg/kg
PBS	chromium	0.19 mg/kg	0.95 mg/kg
CCB2	cobalt	1.80 ug/L	1.80 mg/kg
CCB2	iron	29.6 ug/L	29.6 mg/kg
CCB3	manganese	13.4 ug/L	13.4 mg/kg
CCB2	nickel	1.70 ug/L	1.70 mg/kg
CCB2	potassium	189 ug/L	189 mg/kg
ICB	selenium	3.40 ug/L	3.40 mg/kg
CCB2	silver	2.10 ug/L	2.10 mg/kg
CCB1	thallium	7.80 ug/L	7.80 mg/kg
CCB2	vanadium	1.30 ug/L	1.30 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank, were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB3	arsenic	-2.70 ug/L	2.70 mg/kg
CCB3	copper	-1.40 ug/L	1.40 mg/kg
CCB3	sodium	-32.1 ug/L	32.1 mg/kg

CCB = Continuing Calibration Blank

All associated positive sample results were greater than 5X the absolute value of the negative blank results. No action was required.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	2 ug/L
cadmium	3 ug/L
manganese	5 ug/L
sodium	10 ug/L
zinc	1 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
chromium	-3 ug/L
cobalt	-1 ug/L
copper	-6 ug/L
lead	-3 ug/L
nickel	-6 ug/L
potassium	-80 ug/L
selenium	-7 ug/L
silver	-2 ug/L
vanadium	-2 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) was 22.7% for potassium in dilution sample 695M000201L, which exceeded the 10% QC limit. The detections of potassium in the two SDG samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Difference (RPD) was 41% for aluminum in duplicate sample 695M000201MD, which exceeded the 35% QC limit for soil samples. The detection of aluminum in sample 695M000201 was flagged as estimated.

VIII.) Matrix Spike Recoveries (MS):

The Percent Recovery (%R) was 39% for antimony in spiked sample 695M000201MS, which was below the 75-125% QC limits. The non-detect result for antimony in unspiked sample 695M000201 was flagged as estimated (UJ).

The Percent Recovery (%R) was 63% for cyanide in spiked sample 695M000101MS, which was below the 75-125% QC limits. The non-detect result for cyanide in unspiked sample 695M000101 was flagged as estimated (UJ).

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

ORGANOTIN

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Organotin was not detected in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XI.) System Performance:

All System Performance criteria were met. No action was taken.

XII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no positive detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

One LCS was analyzed by the laboratory. All LCS Recovery criteria were met. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0258
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide

SDG NUMBER: 7974 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
161GW00103	7984-01	Water	X	X	X	X	X
161HW00103	7984-02	Water	X	X	X	X	X
162GW00103	7974-01	Water	X	X	X	X	X
162GW00203	7974-02	Water	X	X	X	X	X
166GW00301	7974-03	Water	X				
166GW00301DL	7974-03DL	Water	+				
166GW00401	7974-04	Water	X				
166GW00601	7984-03	Water	X				
166GW00701	7984-04	Water	X				
166GW03D01	7984-05	Water	X				
166GW04D01	7974-06	Water	X				
166GW06D01	7984-05	Water	X				
166GW07D01	7984-06	Water	X				
166GW07D01DL	7984-06DL	Water	+				
698GW00103	7984-07	Water	X	X	X	X	X
161TW00103	7984-08	Water	X				
166TW00301	7984-07	Water	X				
161GW00103MS	7984-01MS	Water	+				


Client	Lab		Volatile	Semi-	Pesticides/	Total	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Metals</u>	<u>Cyanide</u>
161GW00103MSD	7984-01MSD	Water	+				
162GW00203MD	7984-02MD	Water				+	
162GW00203MS	7974-02MS	Water	+			+	
162GW00203MSD	7974-02MSD	Water	+				
161HW00103MD	7984-02MD	Water					+
161HW00103MS	7984-02MS	Water					+

+ = Non-billable analysis

H = FIELD DUPLICATE, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7974 CLP Organics and Inorganics

SAMPLES: 161GW00103, 161HW00103, 162GW00103, 162GW00203, 166GW00301, 166GW00301DL, 166GW00401, 166GW00601, 166GW00701, 166GW03D01, 166GW04D01, 166GW06D01, 166GW07D01, 166GW07D01DL, 698GW00103, 161TW00103, 166TW00301, 161GW00103MS, 161GW00103MSD, 162GW00203MD, 166GW00203MS, 166GW00203MSD, 161HW00103MD, 161HW00103MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) was 29.8% for 2-chloroethyl vinyl ether in the standard analyzed on 8/4/97 at 15:55 on instrument HP6, which exceeded the 25% QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 161GW00103, 161HW00103, 166GW00601, 166GW00701, 166GW07D01 and 698GW00103.

The Relative Response Factor (RRF) was 0.047 for 2-chloroethyl vinyl ether in the standard analyzed on 8/5/97 at 04:28 on instrument HP6, which was below the 0.050 QC limit. The non-detect results for this compound in sample 166GW06D01 and trip blank 161TW00103 were rejected (R).

The Percent Differences (%D's) were 30.0% and 54.8%, respectively, for acetone and 2-chloroethyl vinyl ether in the standard analyzed on 8/5/97 at 04:28 on instrument HP6, which exceeded the 25% QC limit. The non-detect result for acetone in sample 166GW06D01 was flagged as estimated (UJ). Since 2-chloroethyl vinyl was previously rejected in the associated sample because of a low RRF in this calibration, no further action was taken.

IV.) Blanks:

Method Blanks:

Acetone was detected at 2 ug/L in water method blank VBW0731A. The detection of acetone in sample 162GW00103 was flagged as undetected (U) with the analytical result below the CRQL being replaced with the CRQL.

Trip Blank:

Acetone was detected at 2 ug/L in trip blank 161TW00103. All results for acetone in the associated sample less than 10X the blank amount were flagged as undetected (U) with analytical results less than the CRQL being replaced with the CRQL. The associated samples were 166GW00601, 166GW03D01 and 698GW00103.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method and trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

One pair of field duplicate samples (161GW00103 / 161HW00103) was analyzed in this SDG. There were no calculable Relative Percent Differences (RPD's) for this sample pair. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentration of acetone in sample 166GW00301 exceeded the standard calibration range. The concentration of this compound in the original analysis was replaced by the validator with the diluted

sample (166GW00301DL) result with the appropriate qualifier (D). In addition, the concentration of trichloroethene in sample 166GW07D01 exceeded the standard calibration range. The concentration of this compound in the original analysis was replaced by the validator with the diluted sample (166GW07D01DL) result with the appropriate qualifier (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for 2-chloroethyl vinyl ether in sample 166GW06D01 and trip blank 161TW00103 were rejected because of a low RRF in the associated continuing calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Difference (%D) was 26.9% for pyridine in the standard analyzed on 8/1/97 at 19:20 on instrument HP7, which exceeded the 25% QC limit. The non-detect results for this compound in samples 162GW00103 and 162GW00203 were flagged as estimated (UJ).

IV.) Blanks:

Diethylphthalate and bis(2-ethylhexyl)phthalate were detected at 15 ug/L and 1ug/L, respectively, in method blank SBLKEJ. The detections of diethylphthalate in associated samples 161GW00103, 161HW00203 and 698GW00103, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL.

Bis(2-ethylhexyl)phthalate was not detected in the three samples. No further action was necessary.

Tentatively Identified Compounds (TIC):

4-Hydroxy-4-methyl-2-pentanone was detected in method blank VBLKAC at a sufficient concentration to eliminate, by applying the 5X Action Limit Rule, the detection of this compound in samples 162GW00103 and 162GW00203. Since data validation action based on blank TIC's was not required, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed by the laboratory. Two LCS recoveries exceeded the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples 161GW00103 and 161HW00103 were analyzed in this SDG. There were no calculable Relative Percent Differences (RPD's) for this sample pair. No action was necessary.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticides Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) of tetrachloro-m-xylene (TCX) were 197% and 234%, respectively, on the primary and secondary columns in sample 698GW00103, which exceeded the 30-150% QC limits. Since there were no detections in this sample, no action was taken.

VI.) Laboratory Control Sample (LCS):

Four LCS's were analyzed by the laboratory. One LCS Recovery was below the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples 161GW00103 and 161HW00103 were analyzed in this SDG. There were no calculable Relative Percent Differences (RPD's) for this sample pair. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All Florisil Cartridge Check criteria were met. No action was necessary.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All criteria were met. No action was required.

XII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Action Level</u>
CCB3	aluminum	61.9 ug/L	310 ug/L
CCB3	beryllium	0.90 ug/L	4.50 ug/L
CCB3	calcium	35.0 ug/L	175 ug/L
CCB3	chromium	1.60 ug/L	8.00 ug/L
CCB3	cobalt	1.50 ug/L	7.50 ug/L
CCB3	magnesium	7.60 ug/L	38.0 ug/L
CCB3	silver	1.80 ug/L	9.00 ug/L
PBW	zinc	3.33 ug/L	16.7 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water

samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB3	copper	-1.40 ug/L	7.00 ug/L
ICB	mercury	-0.20 ug/L	1.00 ug/L
ICB	magnesium	-3.80 ug/L	19.0 ug/L
PBW	nickel	-1.76 ug/L	8.80 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
arsenic	4 ug/L
cadmium	4 ug/L
manganese	5 ug/L
sodium	135 ug/L
zinc	7 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
chromium	-3 ug/L
cobalt	-1 ug/L
copper	-7 ug/L
lead	-2 ug/L
nickel	-8 ug/L
potassium	-123 ug/L
selenium	-5 ug/L
silver	-2 ug/L
thallium	-9 ug/L
vanadium	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

All MS Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 161GW00103 and 161HW00103 were analyzed in this SDG. The calculable Relative Percent Differences were:

<u>Compound</u>	<u>161GW00103</u>	<u>161HW00103</u>	<u>RPD</u>
calcium	48900 ug/L	48300 ug/L	1.2%
zinc	27.3 ug/L	26.2 ug/L	4.1%

Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0260
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide, Alkalinity, Chlorides, Ferrous Iron, Nitrates, Sulfates, Total Organic Carbon (TOC), Methane

SDG NUMBER: 7990 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
163GW00103	7990-01	Water	X	X	X	X	X
163GW00103RE	7990-01RE	Water		+			
163HW00103	7990-02	Water	X	X	X	X	X
163HW00103RE	7990-02RE	Water		+			
166GW00201	8008-01	Water	X				
166GW00501	8001-01	Water	X				
166GW00801	7990-06	Water	X				
166GW02D01	8008-02	Water	X				
166GW05D01	8001-05	Water	X				
166HW05D01	8001-06	Water	X				
166GW08D01	7990-07	Water	X				
166GW09D01	7990-08	Water	X				
166GW10D01	8008-03	Water	X				
166GW10D01DL	8008-03DL	Water	+				
166GW11D01	8008-04	Water	X				
166GW12D01	8001-04	Water	X				
GDKGW00103	8001-02	Water	X	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
GDKGW00103RE	8001-02RE	Water		+			
GDKGW00203	8001-03	Water	X	X	X	X	X
GDKGW00203RE	8001-03RE	Water		+			
163DW00103	7990-03	Water	X	X	X	X	X
163GW00103RE	7990-03RE	Water		+			
163EW00103	7990-04	Water	X	X	X	X	X
163EW00103RE	7990-04RE	Water		+			
163FW00103	7990-05	Water	X	+	X	X	X
163FW00103RE	7990-05RE	Water		X			
163TW00103	7990-03	Water	X				
166TW05D01	8001-07	Water	X				
166TW11D01	8008-05	Water	X				
GDKGW00103MS	8001-02MS	Water	+				
GDKGW00103MSD	8001-02MSD	Water	+				
163GW00103MD	7990-01MD	Water				+	+
163GW00103MS	7990-01MS	Water				+	+

Client Sample #	Lab Sample #	Matrix	Alkalinity	Chlorides	Ferrous Iron	Nitrates
166GW00201	8008-01	Water	X	X	X	X
166GW00501	8001-01	Water	X	X	X	X
166GW02D01	8002-02	Water	X	X	X	X
166GW10D01	8008-03	Water	X	X	X	X
166GW11D01	8008-04	Water	X	X	X	X
166GW00201MD	8008-01MD	Water				+
166GW00201MS	8008-01MS	Water				+
166GW00501MD	8001-01MD	Water			+	+
166GW00501MS	8001-01MS	Water			+	+
166GW11D01MD	8008-04MD	Water	+	+		
166GW11D01MS	8008-04MS	Water		+		

Client Sample #	Lab Sample #	Matrix	Sulfates	TOC	Methane
166GW00201	8008-01	Water	X	X	X
166GW00501	8001-01	Water	X	X	X
166GW02D01	8002-02	Water	X	X	X
166GW10D01	8008-03	Water	X	X	X
166GW11D01	8008-04	Water	X	X	X
166GW00201MD	8008-01MD	Water		+	
166GW00201MS	8008-01MS	Water		+	
166GW10D01MD	8008-03MD	Water	+		
166GW10D01MS	8008-03MS	Water	+		
166GW11D01MD	8008-04MD	Water	+		

+ = Non-billable analysis

DL = DILUTION, DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD BLANK, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX
SPIKE DUPLICATE, RE = REANALYSIS, TW = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in cursive script, reading "Jean M. Delashmit". The signature is written in black ink and is positioned to the right of the "RELEASE SIGNATURE:" label.

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 7990 CLP Organics and Inorganics

SAMPLES: 163GW00103, 163GW00103RE, 163HW00103, 163HW00103RE, 166GW00201, 166GW00501, 166GW00801, 166GW02D01, 166GW05D01, 166HW05D01, 166GW08D01, 166GW09D01, 166GW10D01, 166GW10D01DL, 166GW11D01, 166GW12D01, GDKGW00103, GDKGW00103RE, GDKGW00203, GDKGW00203RE, 163DW00103, 163DW00103RE, 163EW00103, 163EW00103RE, 163FW00103, 163FW00103RE, 163TW00103, 166TW05D01, 166TW11D01, GDKGW00103MS, GDKGW00103MSD, 163GW00103MS, 163GW00103MSD, 166GW00201MD, 166GW00201MS, 166GW00501MD, 166GW00501MS, 166GW11D01MD, 166GW11D01MS, 166GW10D01MD, 166GW10D01MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) was 29.8% for 2-chloroethyl vinyl ether in the standard analyzed on 8/4/97 at 15:55 on instrument HP6, which exceeded the 25% QC limit. The non-detect results for this compound in associated samples 163GW00103 and 163HW00103 were flagged as estimated (UJ).

The Relative Response Factor (RRF) was 0.046 for 2-chloroethyl vinyl ether in the standard analyzed on 8/5/97 at 04:28 on instrument HP6, which was below the 0.050 QC limit. All results for this compound in the associated samples and field blanks, which consisted entirely of non-detects, were rejected (R). The associated samples and field blanks were 166GW00501, 166GW00801, 166GW05D01, 166HW05D01, 166GW08D01, 166GW09D01, 166GW12D01, GDKGW00103, GDKGW00203, 163DW00103, 163EW00103, 163FW00103 and 163TW00103.

The Percent Differences (%D's) were 30.0% and 54.8%, respectively, for acetone and 2-chloroethyl vinyl ether in the standard analyzed on 8/5/97 at 04:28 on instrument HP6, which exceeded the 25%

QC limit. The non-detect results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. All results for acetone in the associated samples, which consisted entirely of non-detects after blank qualifications, were flagged as estimated (UJ). The associated samples were 166GW00501, 166GW00801, 166GW05D01, 166HW05D01, 166GW08D01, 166GW09D01, 166GW12D01, GDKGW00103 and GDKGW00203.

The Percent Differences (%D's) were 26.0% and 33.6%, respectively, for chloroethane and 2-chloroethyl vinyl ether in the standard analyzed on 8/13/97 at 09:44 on instrument HP6, which exceeded the 25% QC limit. All results for these two compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GW00201, 166GW02D01, 166GW10D01 and 166GW11D01.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was taken.

Field Blanks:

Acetone, chloroform and bromodichloromethane were detected at 11 ug/L, 8 ug/L and 23 ug/L, respectively, in deionized water blank 163DW00103. The detections of acetone in the associated samples, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL. The associated samples were 166GW00201, 166GW00501, 166GW02D01, 166HW05D01, 166GW05D01, 166GW10D01, 166GW11D01 and 166GW12D01. Chloroform and bromodichloromethane were not detected in the SDG samples. No further action was necessary.

Chloroform and bromodichloromethane were detected at 6 ug/L and 2 ug/L, respectively, in equipment rinsate blank 163EW00103. These two compounds were not detected in the SDG samples. No action was required.

Chloroform and bromodichloromethane were detected at 5 ug/L and 2 ug/L, respectively, in field blank 163FW00103. These two compounds were not detected in the SDG samples. No action was required.

Trip Blanks:

Acetone was detected at 2 ug/L each in trip blanks 166TW11D01 and 163TW00103. Acetone was qualified using the deionized water blank. No action was necessary.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

The Relative Percent Difference (RPD) was 6.7% for trichloroethene in duplicate samples 166GW05D01 and 166HW05D01, which was within the 30% QC limit for water samples. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentration of trichloroethene in sample 166GW10D01 exceeded the standard calibration range. The concentration of this compound in the original analysis was replaced by the validator with the diluted sample (166GW10D01DL) result with the appropriate qualifier (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for 2-chloroethyl vinyl ether were rejected in samples 166GW00501, 166GW00801, 166GW05D01, 166HW05D01, 166GW08D01, 166GW09D01, 166GW12D01, GDKGW00103, GDKGW00203, 163DW00103, 163EW00103, 163FW00103 and 163TW00103 because of a low RRF in the continuing calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

The holding time from sample date to reextraction date was 15 days for field blank 163FW00103RE, which exceeded the 7 day QC limit. Since this sample was a field blank, no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 31.6% for hexachlorocyclopentadiene in the standards analyzed on 8/12/97 on instrument HP7, which exceeded the 30% QC limit. Since there were no detections of this compound in the SDG samples, no action was necessary.

Continuing Calibration:

The Percent Differences (%D's) were 49.5% and 30.8%, respectively for benzyl alcohol and benzoic acid in the standard analyzed on 8/7/97 at 12:56 on instrument HP7, which exceeded the 25% QC limit. Since the only associated samples were field blanks, no action was required.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was taken.

Field Blanks:

Diethylphthalate was detected at 2 ug/L in deionized water blank 163DW00103. The detections of this compound in the associated samples, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL. The affected samples were 163GW00103, 163HW00103, GDKGW00103 and GDKGW00203.

Tentatively Identified Compounds (TIC):

TIC's were not detected in the method or field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met for the sample analyses selected for validation. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed by the laboratory. Seven LCS recoveries were below the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences in the set of field duplicate samples analyzed in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met. No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All samples were reextracted and reanalyzed because of several low LCS recoveries. The original analyses of samples 163GW00103, 163HW00103, GDKGW00103, GDKGW00203, deionized water blank 163DW00103 and equipment rinsate blank 163EW00103 were considered by the validator to be of preferable data quality as compared to the reanalyses because of better holding times. The reanalysis of field blank 163FW00103 was considered by the validator to be of preferable data quality as compared to the original analysis because of improved surrogate recoveries. All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Pesticides Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration were met. No action was required.

IV.) Blanks:

There were no detections in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. Six LCS recoveries were below the QC limits. Data validation action based on LCS Recovery was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences in the set of field duplicate samples analyzed in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was necessary.

Gel Permeation Chromatography (GPC):

GPC Cleanup was not required in this SDG. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All criteria were met. No action was required.

XII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max Conc.</u>	<u>5X Action Level</u>
FB	aluminum	412 ug/L	2060 ug/L
FB	barium	1.80 ug/L	9.00 ug/L
CCB3	beryllium	0.20 ug/L	1.00 ug/L
ERB	calcium	58.1 ug/L	291 ug/L
FB	copper	2.30 ug/L	11.5 ug/L
FB	iron	19.6 ug/L	98.0 ug/L
ERB	magnesium	26.9 ug/L	135 ug/L
FB	potassium	293 ug/L	1470 ug/L
FB	sodium	2360 ug/L	11800 ug/L
PBW	thallium	4.66 ug/L	23.3 ug/L
FB	tin	65.7 ug/L	329 ug/L
FB	zinc	17.6 ug/L	88.0 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water),
ERB = Equipment Rinsate Blank (163EW00103), FB = Field Blank (163FW00103)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, preparation, equipment rinsate

or field blank, were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank</u> <u>Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB2	arsenic	-5.00 ug/L	25.0 ug/L
CCB2	calcium	-27.7 ug/L	139 ug/L
PBW	chromium	-1.15 ug/L	5.75 ug/L
PBW	cobalt	-1.88 ug/L	9.40 ug/L
CCB2	copper	-1.30 ug/L	6.50 ug/L
PBW	nickel	-1.62 ug/L	8.10 ug/L
PBW	silver	-1.42 ug/L	7.10 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
cadmium	3 ug/L
manganese	5 ug/L
sodium	26 ug/L
thallium	4 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-2 ug/L
cadmium	-3 ug/L
cobalt	-3 ug/L
copper	-7 ug/L
nickel	-7 ug/L
potassium	-80 ug/L
silver	-4 ug/L
thallium	-4 ug/L
tin	-31 ug/L
vanadium	-2 ug/L
zinc	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) was 21.8% for sodium in dilution sample 163GW00103L, which exceeded the 10% QC limit. The detections of sodium in the four SDG samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was necessary.

VIII.) Matrix Spike Recoveries (MS):

All MS Recovery criteria were met. No action was taken.

IX.) Field Duplicates:

One set of field duplicate samples (163GW00103 / 163HW00103) was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>163GW00103, ug/L</u>	<u>163HW00103, ug/L</u>	<u>RPD</u>
aluminum	437	385	13%
calcium	6640	6530	1.7%
sodium	16200	16400	1.2%

None of the RPD's exceeded the 30% QC limit for water samples. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

ALKALINITY

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

LCS's were not analyzed in this fraction of the SDG. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

Matrix Spike samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORIDES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was required.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

FERROUS IRON

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was required.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

NITRATES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFATES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFATES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicates were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL ORGANIC CARBON (TOC)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

There were no detections in the method or preparation blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

V.) Laboratory Duplicate Analysis:

All Laboratory Duplicate Analysis criteria were met. No action was taken.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

METHANE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

Methane was not detected in the method blanks. No action was required.

IV.) Laboratory Control Samples (LCS):

LCS's were not analyzed in this fraction of the SDG. No action was taken.

V.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was taken.

VIII.) System Performance:

All System Performance criteria were met. No action was taken.

IX.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0263
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSIS: Volatile Organics
SDG NUMBER: 8110 (Level III)

SAMPLES:

Client	Lab		Volatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
166GP08235	8110-01	Water	X
166GP08325	8120-01	Water	X
166GP08425	8110-02	Water	X
166GP08632	8110-03	Water	X
166GP08722	8110-04	Water	X
166GP08822	8120-02	Water	X
166GP08922	8120-04	Water	X
166GP09035	8120-05	Water	X
166GP09232	8120-03	Water	X
166TP08722	8110-05	Water	X
166TP09035	8120-06	Water	X
166GP08235MS	8110-01MS	Water	+
166GP08235MSD	8110-01MSD	Water	+
166GP08822MS	8120-02MS	Water	+
166GP08822MSD	8120-02MSD	Water	+

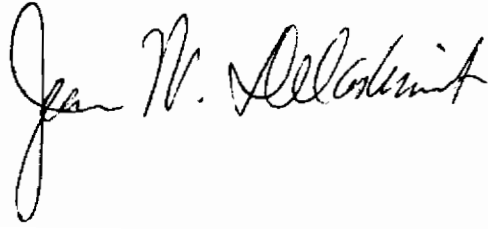
+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, TP = TRIP BLANK

DATA REVIEWER(S):

Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large, looping initial "J".

Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 8110 Volatile Organics

SAMPLES: 166GP08235, 166GP08325, 166GP08425, 166GP08632, 166GP08722,
166GP08822, 166GP08922, 166GP09035, 166GP09232, 166TP08722,
166TP09035, 166GP08235MS, 166GP08235MSD, 166GP08822MS,
166GP08822MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Acetone was detected at 4 ug/L in method blank VBW0821A. Detections of acetone in associated samples 166GP08235, 166GP08425, 166GP08632 and 166GP08722, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

Trip Blanks:

Acetone was detected at 11 ug/L in trip blank 166TP09035. Detections of acetone in associated samples 166GP08325, 166GP08822, 166GP08922, 166GP09035 and 166GP09232, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS's):

Two LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0265
CONTRACTED LAB: CEIMIC Corporation
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics
SDG NUMBER: 8221

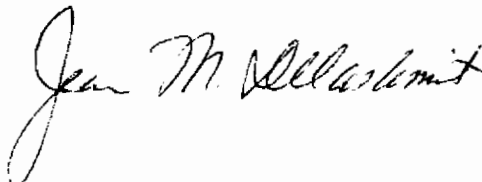
SAMPLES:

Client	Lab		Volatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
166SR00101	8221.05	Water	X
166SW00101	8221.01	Water	X
166SW00201	8221.02	Water	X
166SW00301	8221.03	Water	X
166SW00401	8221.04	Water	X
166TW00101	8221.06	Water	X
166SW00201MS	8221.02MS	Water	+
166SW00201MSD	8221.02MSD	Water	+

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, R = FIELD DUPLICATE,
T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 8221 CLP Organics

SAMPLES: 166SR00101, 166SW00101, 166SW00201, 166SW00301, 166SW00401, 166TW00101,
166SW00201MS, 166SW00201MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 9/12/97 at 08:40 on instrument HP6 for 2-chloroethyl vinyl ether (32.4%). The results for this compound in all SDG samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

Acetone was detected at 2 ug/L in method blank VBW0912A. The detections of acetone in samples 166SW00201 and 166SW00301, which were below the CRQL, were flagged as undetected (U) with the analytical results being replaced with the CRQL.

Trip Blank:

There were no detections in the trip blank. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All LCS criteria were met. No action was required.

VIII.) Field Duplicates:

One set of field duplicate samples, 166SW00101 / 166SR00101, was analyzed by the laboratory in this SDG. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>166SW00101</u>	<u>166SR00101</u>	<u>RPD</u>
trichloroethene	26 ug/L	25 ug/L	3.9%
tetrachloroethene	43 ug/L	42 ug/L	2.3%

Since the RPD's were within the 30% QC limit for water samples, no action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0269
CONTRACTED LAB: Southwest Laboratory of Oklahoma Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics
SDG NUMBER: 31226 (Level III)

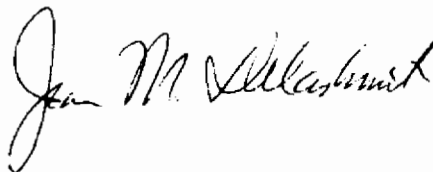
SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>
166GSW0101	8221.05	Water	X
166GSW0201	8221.01	Water	X
166GSW0301	8221.02	Water	X
166GSW0401	8221.03	Water	X
166GSW0501	8221.04	Water	X
166DSW0101	8221.06	Water	X

D = DEIONIZED WATER BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 31226 CLP Organics

SAMPLES: 166GSW0101, 166GSW0201, 166GSW00301, 166GSW00401, 166GSW0501
166DSW0001

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit in the standard analyzed on 10/2/97 at 09:57 on instrument N for the following compounds:

chloroethane	25.7%
acetone	54.2%
2-butanone	50.0%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GSW0201, 166GSW0301, 166GSW0401 and 166GSW0501.

The Percent Differences (%D's) exceeded the 25% QC limit in the standard analyzed on 10/6/97 at 08:38 on instrument N for the following compounds:

bromomethane	53.4%
chloroethane	32.9%
acetone	51.7%
2-butanone	46.9%
vinyl acetate	25.9%

All results for these compounds in sample 166GSW0101, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blanks. No action was taken.

Deionized Water Blank:

The following compounds were detected in deionized water blank 166DSW0201:

1,2-dichloroethene	2 ug/L
trichloroethene	13 ug/L
tetrachloroethene	10 ug/L

The detections of these compounds in associated samples 166GSW0101, 166GSW0201 and 166GSW0301, which were less than 5X the blank amounts, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method or deionized water blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. Four LCS recoveries exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0270
CONTRACTED LAB: CEIMIC Corporation
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994*

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Total Volatiles

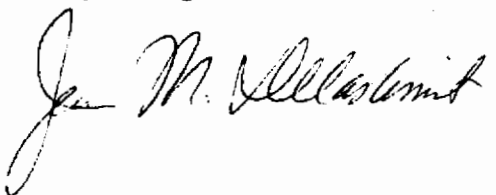
SDG NUMBER: 8389

SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>
166GW00202	8389.01	Water	X
166GW00302	8389.06	Water	X
166GW00402	8389.09	Water	X
166GW00502	8389.11	Water	X
166GW02D02	8389.05	Water	X
166GW03D02	8389.07	Water	X
166GW04D02	8389.10	Water	X
166GW05D02	8389.12	Water	X
166HW05D02	8389.13	Water	X
166DW00202	8389.02	Water	X
166EW00202	8389.03	Water	X
166FW00202	8389.04	Water	X
166TW03D02	8389.08	Water	X
166DW00202MS	8389.02MS	Water	+
166DW00202MSD	8389.02MSD	Water	+

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK,
H = FIELD DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE: 

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC Corporation - 8389 CLP Volatile Organics

SAMPLES: 166GW00202, 166GW00302, 166GW00402, 166GW00502, 166GW02D02,
166GW03D02, 166GW04D02, 166GW05D02, 166HW05D05, 166DW00202,
166EW00202, 166FW00202, 166TW03D02, 166DW00202MS, 166DW00202MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

Acetone was detected at 3 ug/L in method blank VBW1016A. All results for this compound in the associated samples were flagged based on the equipment rinsate blank. No further action was required.

Deionized Water Blank:

Acetone, chloroform and 2-butanone were detected at 5 ug/L, 6 ug/L and 2 ug/L, respectively, in deionized water blank 166DW00202. All results for acetone in the associated samples were flagged based on the equipment rinsate blank. There were no positive results for the other two compounds in the associated samples. No action was required.

Equipment Rinsate Blank:

Acetone and chloroform were both detected at 6 ug/L in equipment rinsate blank 166EW00202. All positive results for acetone in the samples in this SDG, less than 10X the blank amount, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL. There were no positive results for chloroform in the associated samples. No further action was required.

Field Blank:

Chloroform was detected at 6 ug/L in field blank 166FW00202. There were no positive results for this compound in the associated samples. No action was required.

Trip Blank:

There were no positive detections in the trip blank in this SDG. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All LCS Recovery criteria were met. No action was required.

VIII.) Field Duplicates:

One set of field duplicate samples (166GW05D02 / 166HW05D02) was analyzed by the laboratory. The Relative Percent Difference (RPD) for trichloroethene was 20%, which was within the 30% QC limit for water samples. No action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0271
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994*
SAMPLE MATRIX: Water
TYPES OF ANALYSIS: Volatile Organics
SDG NUMBER: 8397 (Level III)

SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Volatile</u> <u>Organics</u>
166GW00602	8397-01	Water	X
166GW00702	8397-02	Water	X
166GW00802	8397-07	Water	X
166GW06D02	8397-03	Water	X
166GW07D02	8397-04	Water	X
166GW07D02DL	8397-04DL	Water	+
166GW08D02	8397-08	Water	X
166GW09D02	8397-05	Water	X
166GW10D02	8397-09	Water	X
166GW10D02DL	8397-09DL	Water	+
166GW11D02	8397-10	Water	X
166GW12D02	8397-11	Water	X
166TW09D02	8397-06	Water	X
166GW00602MS	8397-01MS	Water	+
166GW00602MSD	8397-01MSD	Water	+

+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE: 

Data Qualifier Definitions

J	-	The associated numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 8397 Volatile Organics

SAMPLES: 166GW00602, 166GW00702, 166GW00802, 166GW06D02, 166GW07D02, 166GW07D02DL, 166GW08D02, 166GW09D02, 166GW10D02, 166GW10D02DL, 166GW11D02, 166GW12D02, 166TW09D02, 166GW00602MS, 166GW00602MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Acetone was detected at 4 ug/L in method blank VBW1020A. Detections of acetone in associated samples 166GW00602 and 166GW00802, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

Trip Blanks:

There were no detections in the trip blank. No action was necessary.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS's):

One LCS was analyzed by the laboratory. All Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentrations of trichloroethene in samples 166GW07D02 and 166GW10D02 exceeded the standard calibration range. The results for trichloroethene in the two original analyses were replaced by the validator with the dilution analysis results (166GW07D02DL and 166GW10D02DL) and the corresponding flags (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0186
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level IV
EPA METHOD: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals, Cyanide, Total Recoverable Petroleum Hydrocarbons - Diesel Range Organics (DRO), Total Recoverable Petroleum Hydrocarbons - Gasoline Range Organics (GRO), Hexavalent Chromium (HexaCr), Explosives, Nitrates, Sulfide

SDG NUMBER: 6811.1 (Level IV)

SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi- volatiles</u>	<u>Pesticides/ PCB's</u>	<u>Organophos. Pesticides</u>
166CB00102*	6811.13	Soil	X	X	X	X
166CB00202*	6811.12	Soil	X	X	X	X
1627000201	6811.01	Water	X	X	X	X
162E000201	6811.02	Water	X	X	X	X

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Total Metals</u>	<u>Cyanide</u>	<u>HexaCr</u>
166CB00102*	6811.13	Soil	X	X	X	X
166CB00202*	6811.12	Soil	X	X	X	X
1627000201	6811.01	Water	X	X	X	X
162E000201	6811.02	Water	X	X	X	X
166CB00202MS	6811.12MS	Soil				+

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Total</u> <u>Metals</u>	<u>Cyanide</u>	<u>HexaCr</u>
166CB00202MD	6811.12MD	Soil				+
1627000201MS	6811.01MS	Water				+
1627000201MD	6811.01MD	Water				+

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>DRO</u>	<u>GRO</u>	<u>Explosives</u>
1627000201	6811.01	Water	X	X	X
162E000201	6811.02	Water	X	X	X
1627000201MS	6811.01MS	Water	+		
1627000201MSD	6811.01MSD	Water	+		

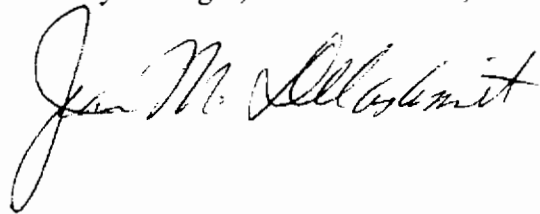
<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Nitrate</u>	<u>Sulfide</u>
1627000201	6811.01	Water	X	X
162E000201	6811.02	Water	X	X
162E000201MS	6811.02MS	Water	+	+
162E000201MSD	6811.02MSD	Water	+	+

* = Corresponding samples 166SB00102 and 166SB00202 were analyzed in SDG 6811.

C = FIELD DUPLICATE, E = EQUIPMENT RINSATE BLANK, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, 7 = PVC BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 6811.1 Appendix IX CLP Inorganics

SAMPLES: 166CB00102, 166CB00202, 1627000201, 1627000201MS, 1627000201MSD,
162E000201, 162E000201MS, 162E000201MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 12/09/96 on instrument HP2 for the following compounds:

propionitrile	0.007
acetonitrile	0.011
1,4-dioxane	0.013
isobutyl alcohol	0.029

The results for these compounds in associated PVC blank 1627000201 and equipment rinsate blank 162E000201, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) for acetone was 31.4% for the standards analyzed on 12/09/96 on instrument HP2. Acetone was not detected in the associated samples. No action was taken.

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 12/09/96 on instrument HP6 for the following compounds:

propionitrile	0.020
acetonitrile	0.027
1,4-dioxane	0.017

The results for these compounds in associated samples 166CB00102 and 166CB00202, which consisted

entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) for acetone was 36.1% for the standards analyzed on 12/09/96 on instrument HP6. The positive result for this compound in associated sample 166CB00202 was flagged as estimated (J).

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was required.

Equipment Rinsate Blank:

There were no detections in the equipment rinsate blank in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile and 1,4-dioxane were rejected in all samples and blanks in this SDG based on low RRF's in the initial calibration. The non-detect results for isobutyl alcohol in blanks 1627000201 and 162E000201 were rejected because of a low RRF in the initial calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 12/15/96 on instrument HP1 for isosafrole (0.029) and kepone (0.048). The results for these compounds in associated samples 166CB00102 and 166CB00202 and field blanks 162E000201 and 1627000201, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/15/96 on instrument HP1 for the following compounds:

1-naphthylamine	41.4%
kepone	55.3%
n-nitrosodiphenylamine	43.4%
diallate	46.7%
methapyrilene	55.7%
3,3'-dichlorobenzidine	78.1%

famphur	37.0%
hexachlorophene	33.9%

There were no positive results for these compounds in the associated samples. No action was required.

Continuing Calibration:

The Relative Response Factor (RRF) of isosafrole was 0.029 for the standard analyzed on 12/18/96 at 08:27 on instrument HP6, which was below the 0.050 QC limit. The results for this compound in the associated samples were previously rejected because of a low RRF in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/18/96 at 08:27 on instrument HP1 for the following compounds:

1-naphthylamine	46.5%
phorate	26.9%
sulfotepp	32.2%
phenacetin	30.3%
phenanthrene	35.6%
disulfoton	26.1%
di-n-butylphthalate	25.8%
parathion	31.9%
3,3'-dimethylbenzidine	144%
kepone	61.6%
3,3'-dichlorobenzidine	41.0%
famphur	49.0%

The non-detect result for kepone in the associated sample was previously rejected because of a low RRF in the initial calibration. The results for the other compounds in associated sample 166CB00202, which consisted entirely of non-detects, were flagged as estimated (UI).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/24/96 at 09:14 on instrument HP1 for the following compounds:

n-nitrosopiperidine	27.7%
2,4-dinitrophenol	49.0%
4-nitrophenol	46.4%
1-naphthylamine	33.3%
fluorene	25.8%
4-bromophenyl-phenylether	27.3%
sulfotepp	41.1%
phenacetin	37.4%
4-aminobiphenyl	28.9%
methylparathion	33.1%
3,3'-dimethylbenzidine	210%
kepone	52.3%
3,3'-dichlorobenzidine	50.4%

famphur	244%
hexachlorophene	70.2%

The non-detect result for kepone in the associated sample was previously rejected because of a low RRF in the initial calibration. The results for the other compounds in associated samples 166CB00102, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Phenol was detected at 7 ug/L in method blank EBW1209. The only associated positive result for this compound was in PVC blank 1627000201. No action was required.

Phenol was detected at 190 mg/kg in method blank EBS1210A. The detections of this compound in associated samples 166CB00102 and 166CB00202, which were less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

Equipment Rinsate Blank:

Phenol was detected at 8 ug/L in equipment rinsate blank 162E000201. All positive results for this compound in the associated samples were previously flagged using the method blanks. No further action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for isosafrole and kepone were rejected in the samples and field blanks in this SDG because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of triphenylphosphate were 71.6% in PVC blank 1627000201 and 66.1% in equipment rinsate blank 162E000201, which were below the 75-125% QC limits for water samples. No action was required since these were field blanks.

The Percent Recovery (%R) of triphenylphosphate was 48.7% for sample 166CB00102, which was below the 65-135% QC limits for soil samples. All results for this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of DCAA was 129% on the secondary column for PVC blank 162700020, which exceeded the 40-120% QC limits. There were no positive results for this blank. No action was required.

The Percent Recoveries (%R's) of DCAA were 126% on the primary column and 132% on the secondary column for equipment rinsate blank 162E000201, which exceeded the 40-120% QC limits. There were no positive results for this blank. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. All Recovery criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank			Action Level	
Type/ID#	Analyte	Max. Conc.	ug/L	mg/kg
162E000201	aluminum	99.6 ug/L	498	99.6
162E000201	barium	1.40 ug/L	7.00	1.40
ICB	beryllium	0.20 ug/L	1.00	0.20
162E000201	calcium	89.3 ug/L	446	89.3
CCB3	cobalt	0.80 ug/L	4.00	0.80
ICB	copper	5.90 ug/L	29.5	5.90
162E000201	iron	164 ug/L	820	164
PBW	lead	1.73 ug/L	8.65	1.73
162E000201	magnesium	18.4 ug/L	92.0	18.4
162E000201	manganese	2.00 ug/L	10.0	2.00
ICB	nickel	0.90 ug/L	4.50	0.90
PBW	selenium	3.35 ug/L	16.7	3.35
PBS	silver	0.56 mg/kg	0.56	2.80
PBS	sodium	8.14 ug/L	8.14	40.7
162E000201	vanadium	0.96 ug/L	4.80	0.96
ICB	zinc	14.1 ug/L	70.5	14.1

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank, PBS = Preparation Blank (Soil), PBW = Preparation Blank (Water), 162E000201 = Equipment Rinsate Blank

All sample results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water and mg/kg for soil samples) for which the contaminated blank was an associated calibration,

preparation or equipment rinsate blank were flagged as undetected (U). All water samples were blanks, so data qualification was not required for them.

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
PBW	chromium	-0.73 ug/L	0.73 mg/kg
CCB2	potassium	-56.1 ug/L	56.1 mg/kg

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	4 ug/L
lead	2 ug/L
manganese	8 ug/L
thallium	5 ug/L
zinc	8 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-5 ug/L
cobalt	-5 ug/L
copper	-3 ug/L
nickel	-9 ug/L
potassium	-57 ug/L
silver	-4 ug/L
sodium	-164 ug/L
vanadium	-2 ug/L
zinc	-8 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution criteria were met. No action was required.

VI.) Laboratory Control Samples (LCs):

The Percent Recoveries (%R's) exceeded the 80-120% QC limits for the soil LCS for the following analytes:

<u>Analyte</u>	<u>%R</u>
arsenic	128
beryllium	137
cadmium	134
chromium	135
cobalt	128
copper	135
nickel	134
silver	134
thallium	129
vanadium	129

All positive results for these analytes in the soil samples in this SDG were flagged as estimated (J).

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 166CB00102 and 166CSB00202 in this SDG and 166SB00102 and 166SB00202 in SDG 6811, were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>166SB00102, mg/kg</u>	<u>166CB00102, mg/kg</u>	<u>RPD,%</u>
aluminum	6720	3240	70
barium	2.7	4.6	52
calcium	867	112	154
chromium	5.8	2.6	76
iron	802	336	82
magnesium	76.2	67.2	12
potassium	81.9	36.3	77

The positive results for all analytes, except barium and magnesium, were flagged as estimated (J) in these two samples, since their RPD's exceeded the 60% QC limit for soil samples.

Analyte	166SB00202, mg/kg	166CB00202, mg/kg	RPD, %
aluminum	27710	5730	70
calcium	44.9	793	179
chromium	1.5	5.6	115
iron	265	665	86
magnesium	55.5	47.1	16.3
potassium	48	33.5	35.6

The positive results for all analytes, except magnesium and potassium, were flagged as estimated (J) in these two samples, since their RPD's exceeded the 60% QC limit for soil samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

HEXAVALENT CHROMIUM (HexaCr)

I.) Holding Times:

The holding time to analysis was 15 days for sample 166CB00102 and 20 days for sample 166CB00202, which exceeded the 24 hour QC limit. The non-detect results for hexavalent chromium in these samples were flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

There were no positive detections in the blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

There were no LCS's analyzed in this SDG. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Equipment Rinsate Blank:

Diesel Range Organics were not detected in the equipment rinsate blank. No action was required.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Equipment Rinsate Blank:

Gasoline Range Organics were not detected in the equipment rinsate blank. No action was required.

IV.) Surrogates:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

EXPLOSIVES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All HPLC Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the deionized water or equipment rinsate blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

NITRATES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Equipment Rinsate Blank:

Nitrates were not detected in the equipment rinsate blank. No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was necessary.

Equipment Rinsate Blank:

Sulfide was not detected in the equipment rinsate blank. No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0192
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Diesel Range Organics (DRO), Gasoline Range Organics (GRO), Total Metals, Cyanide

SDG NUMBER: 7017 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	DRO
162GW00101	7017-01	Water	X	X	X	X
698GW00101	7017-04	Water	X	X	X	X
GDKGW00201	7017-02	Water	X	X	X	X
698TW00101	7017-03	Water	X			

Client Sample #	Lab Sample #	Matrix	GRO	Total Metals	Cyanide
162GW00101	7017-01	Water	X	X	X
698GW00101	7017-04	Water	X	X	X
GDKGW00201	7017-02	Water	X	X	X
GDKGW00201MS	7017-02MS	Water	+		
GDDGW00102MSD	7017-02MSD	Water	+		

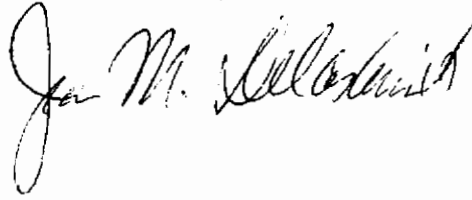
+ = Non-billable QC sample

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S):

Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large initial "J" and "M".

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 7017, CLP Organics and Inorganics

SAMPLES: 162GW00101, 698GW00101, GDKGW00201, 698TW00101, GDKGW00201MS, GDKGW00201MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Trip Blank:

There were no positive detections in the trip blank. No action was taken.

TIC's:

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was taken.

Continuing Calibrations:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 1/13/97 at 10:04 on instrument HP5 for the following compounds:

pyridine	25.8%
benzyl alcohol	41.3%
4-methylphenol	40.5%
2-nitroaniline	32.5%
2,4-dinitrophenol	36.3%
4-nitrophenol	27.7%
4-nitroaniline	28.1%

The results for these compounds in associated samples 162GW00101, 698GW00101 and GDKGW00201, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

There were no positive detections in the method blank, so no action was required.

TIC's:

TIC's were not detected in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. Two Percent Recoveries (%R's) exceeded their respective QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) of tetrachloro-m-xylene (TCX) in sample 698GW00101 was 257% on the primary column and 321% on the secondary column, which exceeded the 30-150% QC limits. The positive result for endosulfan II in this sample was flagged as estimated (J). No further action was necessary.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. One Percent Recovery (%R) exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Diesel Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG, so no action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Gasoline Range Organics were not detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB3	aluminum	59.5 ug/L	298 ug/L
CCB3	arsenic	2.10 ug/L	10.5 ug/L
CCB1	beryllium	0.20 ug/L	1.00 ug/L
CCB3	nickel	1.20 ug/L	6.00 ug/L
CCB3	sodium	6.20 ug/L	31.0 ug/L
PBW	zinc	15.3 ug/L	76.5 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Limit, ug/L for water

samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
ICB	calcium	-34.1 ug/L	171 ug/L
CCB2	copper	-1.10 ug/L	5.50 ug/L
CCB2	magnesium	-21.0 ug/L	105 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

All associated sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	3 ug/L
manganese	9 ug/L
tin	157 ug/L
zinc	24 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-4 ug/L
cadmium	-2 ug/L
chromium	-3 ug/L
cobalt	-5 ug/L
copper	-8 ug/L
lead	-2 ug/L
nickel	-8 ug/L
potassium	-56 ug/L
selenium	-5 ug/L
silver	-4 ug/L
sodium	-147 ug/L
tin	-153 ug/L
vanadium	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) of magnesium (13.7%) exceeded the 10% QC limit for diluted sample 162GW00101L. Positive results for this analyte in the associated SDG samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

Cyanide was not detected in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall
SITE NAME: Charleston Navel Base, Zone K
SERVICE ORDER NUMBER: 0192
CONTRACTED LAB: CEIMIC, Inc.
QA/QC LEVEL: EPA Level III / Level IV
EPA METHOD: EPA SOW 3-90 / SW846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Diesel Range Organics (DRO), Gasoline Range Organics (GRO), Total Metals, Cyanide, Hexavalent Chromium

SDG NUMBERS: 7002.1 (Appendix IX, Level IV)
7002 (Level III)

SAMPLES:

SDG 7002.1 (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Organophos. Pesticides
161HW00101*	7008-03	Water	X	X	X	X
162DW00201	7002-05	Water	X	X	X	X
162EW00201	7002-04	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorinated Herbicides	DRO	GRO
161HW00101*	7008-03	Water	X	X	X
162DW00201	7002-05	Water	X	X	X
162EW00201	7002-04	Water	X	X	X

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	Total <u>Metals</u>	<u>Cyanide</u>	Hexavalent <u>Chromium</u>
161HW00101*	7008-03	Water	X	X	X
162DW00201	7002-05	Water	X	X	X
162EW00201	7002-04	Water	X	X	X
161HW00101MD	7008-03MD	Water		+	+
161HW00101MS	7008-03MS	Water		+	+
162EW00201MD	7002-04MD	Water		+	+
162EW00201MS	7002-04MS	Water		+	+

+ = Non-billable Quality Control Sample

* = Corresponding sample 161GW00101 was analyzed in SDG 7002.

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, H = FIELD DUPLICATE,
MD = MATRIX DUPLICATE, MS = MATRIX SPIKE

SDG 7002 (Level III):

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	Volatile <u>Organics</u>	Semi- volatiles	Pesticides/ <u>PCB's</u>	<u>DRO</u>
161GW00101*	7008-02	Water	X	X	X	X
162GW00201	7002-03	Water	X	X	X	X
163GW00101	7008-04	Water	X	X	X	
166GW00101	7008-01	Water	X	X	X	
GDKGW00101	7002-01	Water	X	X	X	X
GDKFW00101	7002-02	Water	X	X	X	X
GDKFW00101RE	7002-02RE	Water		+		
162TW00201	7002-06	Water	X			
163TW00101	7008-01	Water	X			
163GW00101MS	7008-04MS	Water	+	+	+	
163GW00101MSD	7008-04MSD	Water	+	+	+	

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>GRO</u>	Total <u>Metals</u>	<u>Cyanide</u>
161GW00101*	7008-02	Water	X	X	X
162GW00201	7002-03	Water	X	X	X
163GW00101	7008-04	Water		X	X
166GW00101	7008-01	Water		X	X
GDKGW00101	7002-01	Water	X	X	X
GDKFW00101	7002-02	Water	X	X	X
163GW00101MD	7008-04MD	Water		+	+
163GW00101MS	7008-04MS	Water		+	+
GDKGW00101MS	7002-01MS	Water	+		
GDKGW00101MSD	7002-01MSD	Water	+		

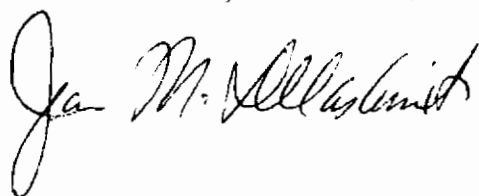
+ = Non-billable Analysis

* = Field duplicate sample 161HW00101 was analyzed in SDG 7002.1.

FW = FIELD BLANK, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REEXTRACTION / REANALYSIS, TW = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large initial "J" and "M".

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 7002.1 Appendix IX, CLP Organics and Inorganics

SAMPLES: 161HW00101, 162DW00201, 162EW00201, 161HW00101MD, 161HW00101MS,
162EW00201MD, 162EW00201MS

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRFs) for propionitrile (0.009), acetonitrile (0.010), isobutyl alcohol (0.029) and 1,4-dioxane (0.012) were below the 0.050 QC limit for the initial calibration analyzed on 1/10/97 on instrument HP6. The non-detect results for these compounds in associated sample 161HW00101, deionized water blank 162DW00201 and equipment rinsate blanks 162EW00201 were rejected (R).

Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Deionized Water Blank:

Acetone and chloroform were detected at 3 ug/L each in deionized water blank 162DW00201. These compounds were not detected in associated sample 161HW00101. No action was taken.

Equipment Rinsate Blank:

Acetone and chloroform were detected at 2 ug/L each in equipment rinsate blank 162EW00201. These compounds were not detected in associated sample 161HW00101. No action was taken.

Field Blank:

There were no positive detections in field blank GDKFW00101, which was analyzed in SDG 7002. No action was necessary.

Trip Blanks:

There were no positive detections in trip blank 163TW00101, which was analyzed in SDG 7002. No action was required.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the duplicate sample pair associated with this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Section IV for blank qualifications.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for propionitrile, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample 161HW00101, deionized water blank 162DW00201 and equipment rinsate blank 162EW00201 because of low RRF's in the initial calibration. The other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for isosafrole (0.030), 4-nitroquinoline-1-oxide (0.007) and aramite (0.048) in the standards analyzed on 1/12/97 on instrument HP1 were below the 0.050 QC limit. The non-detect results for these three compounds in sample 161HW00101, deionized water blank 162DW00201 and equipment rinsate blank 162EW00201 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 1/12/97 on instrument HP1 for the following compounds:

hexachlorocyclopentadiene	30.8%
isosafrole	52.3%
1,4-nitroquinone	44.3%
dimethoate	46.0%
4-nitroquinoline-1-oxide	88.6%
methapyrilene	119%
3,3'-dimethylbenzidine	84.1%
kepone	44.3%
famphur	60.0%
hexachlorophene	46.8%

The non-detect results for isosafrole and 4-nitroquinoline-1-oxide were previously rejected because of low RRF's in this calibration. There were no positive detections of the other compounds in sample 161HW00101. No further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) for isosafrole (0.023), 4-nitroquinoline (0.006) and aramite (0.046) in the standard analyzed on 1/13/97 at 08:52 on instrument HP1 were below the 0.050 QC limit. The non-detect results for these three compounds were previously rejected in sample 161HW0001 and the two field blanks because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 30% QC limit for the standard analyzed on 1/13/97 at 08:52 on instrument HP1 for the following compounds:

hexachlorocyclopentadiene	28.4%
dimethoate	27.1%
3,3'-dimethylbenzidine	41.1%

All results for these compounds in sample 161HW00101, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in these two field blanks. No action was necessary.

Field Blank:

There were no positive detections in field blank GDKFW00101, which was analyzed in SDG 7002. No action was required.

TIC's:

There were no TIC's detected in sample 161HW00101. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was taken.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. Refer to Blank Section IV for qualifications.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for 4-nitroquinoline-1-oxide, aramite and isosafrole were rejected in sample 161HW00101, deionized water blank 162DW00201 and equipment rinsate blank 162EW00201 because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Field, Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in deionized water blank 162DW00201 and equipment rinsate blank 162EW00201. In addition, there were no positive results in field blank GDKFW00101, which was analyzed in SDG 7002. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

One LCS was analyzed in this SDG. One Percent Recovery (%R) was below the QC limits. Data validation action based on LCS criteria was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup data was not required in this SDG. No action was taken.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, no action was required.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. Several Percent Recoveries were below the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG, so no action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

CHLORINATED HERBICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicides Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blank:

Diesel Range Organics were not detected in the method blank. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

Diesel Range Organics were not detected in the two field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable in the field duplicate sample pair in this SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blanks:

Gasoline Range Organics were not detected in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

Gasoline Range Organics were not detected in the two field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Four LCS's were analyzed by the laboratory. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for the field duplicate sample pair in this SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the sample and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
ICB	aluminum	31.7 ug/L	159 ug/L
CCB2	arsenic	1.80 ug/L	9.00 ug/L
ERB	lead	1.90 ug/L	9.50 ug/L
DWB	sodium	14.0 ug/L	70.0 ug/L
DWB	vanadium	0.80 ug/L	4.00 ug/L
DWB	zinc	8.10 ug/L	40.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,

DWB = Deionized Water Blank (162DB00201), ERB = Equipment Rinsate Blank (163EB00201)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, deionized water or equipment rinsate blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
ICB	calcium	-34.1 ug/L	171 ug/L
CCB2	copper	-1.10 ug/L	5.50 ug/L
PBW	magnesium	-21.2 ug/L	106 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
PBW = Preparation Blank (Water)

All associated positive sample results were greater than 5X the absolute value of the negative blank results. No action was required. The associated non-detects were flagged as estimated (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

arsenic	2 ug/L
manganese	7 ug/L
thallium	4 ug/L
tin	56 ug/L
zinc	4 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations above the IDL:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-3 ug/L
cobalt	-5 ug/L
copper	-8 ug/L
lead	-2 ug/L
nickel	-8 ug/L
potassium	-55 ug/L
selenium	-4 ug/L
silver	-4 ug/L
sodium	-147 ug/L
vanadium	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

MS samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples was analyzed. Sample 161HW0001 was analyzed in this SDG and corresponding sample 161GW00101 was analyzed in SDG 7002. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>161HW00101, ug/L</u>	<u>161GW00101, ug/L</u>	<u>RPD, %</u>
aluminum	600	479	22.4
calcium	49500	51100	3.2
iron	149	150	0.7

All RPD's were within the 30% QC limit for water samples. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. Data qualification was not necessary.

III.) Blanks:

Method Blanks:

Cyanide was not detected in the method blanks, so no action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Cyanide was not detected in the deionized water, equipment rinsate and field blank (analyzed in SDG 7002). No action was taken.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Duplicate Sample Analysis (MD):

All Duplicate Sample Analysis criteria were met. No action was required.

VI.) Matrix Spike Recovery (MS):

All Percent Recovery (%R) criteria were met. No action was necessary.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for the field duplicate sample pair analyzed in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. Data qualification was not necessary.

III.) Blank:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized Water and Equipment Rinsate Blanks:

Hexavalent chromium was not detected in the two field blanks. No action was taken.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Duplicate Sample Analysis (MD):

All Duplicate Sample Analysis criteria were met. No action was required.

VI.) Matrix Spike Recovery (MS):

All Percent Recovery (%R) criteria were met. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

The laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

CEIMIC, Inc. - 7002 CLP Organics and Inorganics

SAMPLES: 161GW00101, 162GW00201, 163GW00101, 166GW00101, GDKGW00101, GDKFW00101, GDKFW00101RE, 162TW00201, 163TW00101, 163GW00101MS, 163GW00101MSD, 163GW00101MD, GDKGW00101MS, GDKGW00101MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

Acetone and chloroform each were detected at 3 ug/L in deionized water blank 162DW00201, and at 2 ug/L in equipment rinsate blank 162EW00201. Both field blanks were analyzed in SDG 7002.1. Since there were no positive results for these two compounds in the associated samples, no action was required.

Field Blank:

There were no positive detections in field blank GDKFW00101. No action was necessary.

Trip Blanks:

There were no positive detections in the two trip blanks analyzed in this SDG. No action was taken.

TIC's:

There were no TIC's detected in the SDG samples. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was required.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

The holding time from sample date to reextraction was 19 days for sample GDKFW00101RE, which exceeded the 7 day QC limit for water samples. Since the holding time was exceeded by more than 2X, all results for this sample, which consisted entirely of non-detects, were rejected (R). Further data validation of this sample was discontinued.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of di-n-octylphthalate (32.4%) exceeded the 30% QC limit for the standards analyzed on 1/10/97 on instrument HP3. There were no positive results for this compound in the associated samples. No action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks, no action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive results for deionized water blank 162DW00201 and equipment rinsate blank 162EW00201, which were analyzed in SDG 7002.1. No action was taken.

Field Blank:

There were no detections in field blank GDKFW00101. No action was necessary.

TIC's:

TIC's were not detected in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of phenol-d6 (2%), 2-fluorophenol (0%) and 2-chlorophenol-d4 (1%) were below their respective QC limits for field blank GDKFW00101. Since the %R's were less than

10%, all acid fraction compound results for this blank, which consisted entirely of non-detects, were rejected (R).

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed in this SDG. Two Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of 4-nitrophenol was 83% for spiked sample 163GW00101MSD, which exceeded the 10-80% QC limits. This compound was not detected in unspiked sample 163GW00101. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of field blank GDKFW00101 was considered by the validator to be of preferable data quality as compared to the reanalysis because of its better holding time and surrogate recovery.

All non-detect results for acid fraction compounds in field blank GDKFW00101 were rejected because of very low surrogate recoveries. All other laboratory data were acceptable without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water and Equipment Rinsate Blanks:

There were no detections in the deionized water and equipment rinsate blanks analyzed in SDG 7002.1. No action was necessary.

Field Blank:

There were no positive results in field blank GDKFW00101. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) in the field duplicate sample pair in this SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blank:

Diesel Range Organics were not detected in the method blank. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no detections in the deionized water and equipment rinsate blanks analyzed in SDG 7002.1. No action was necessary.

Field Blank:

Diesel Range Organics were not detected in field blank GDKFW00101. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for the field duplicate sample pair in this SDG. No action was taken

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met, so no action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was required.

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no detections in the deionized water and equipment rinsate blanks analyzed in SDG 7002.1. No action was necessary.

Field Blank:

Gasoline Range Organics were not detected in field blank GDKFW00101. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

Three LCS's were analyzed by the laboratory. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) TCL Compound Identification:

All criteria were met, so no action was required.

IX.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable in the field duplicate sample pair in this SDG. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB3	aluminum	44.7 ug/L	224 ug/L
ICB	antimony	2.00 ug/L	10.0 ug/L
ERB	lead	1.90 ug/L	9.50 ug/L
CCB1	magnesium	6.90 ug/L	34.5 ug/L
DWB	sodium	14.0 ug/L	70.0 ug/L
PBW	vanadium	1.00 ug/L	5.00 ug/L
PBW	zinc	10.3 ug/L	51.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
DWB = Deionized Water Blank 162DB00201 (analyzed in SDG 7002.1),
ERB = Equipment Rinsate Blank 163EB00201 (analyzed in SDG 7002.1),
PBW = Preparation Blank (Water).

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, preparation, deionized water or equipment rinsate blank were flagged as undetected (U).

The following analyte had a negative result with an absolute value greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	selenium	-2.80 ug/L	14.0 ug/L

CCB = Continuing Calibration Blank

All associated sample results were non-detects and were flagged as estimated (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	6 ug/L
manganese	8 ug/L
thallium	4 ug/L
tin	127 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

The following analytes had negative results in ICS Solution A at absolute concentrations greater than the IDL:

barium	-5 ug/L
cadmium	-1 ug/L
chromium	-4 ug/L
cobalt	-5 ug/L
copper	-7 ug/L
lead	-1 ug/L
nickel	-9 ug/L
potassium	-34 ug/L
selenium	-8 ug/L
silver	-4 ug/L
sodium	-156 ug/L
zinc	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis were met. No action was taken.

VIII.) Matrix Spike Recoveries:

All MS Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

Sample 161GW0001 was analyzed in this SDG and field duplicate sample 161HW00101 was analyzed in SDG 7002.1. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>161HW00101, ug/L</u>	<u>161GW00101, ug/L</u>	<u>RPD, %</u>
aluminum	600	479	22.4
calcium	49500	51100	3.2
iron	149	150	0.7

All RPD's were within the 30% QC limit for water samples. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blank:

Method Blanks:

Cyanide was not detected in the method blanks, so no action was required.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the deionized water and equipment rinsate blanks, which were analyzed in SDG 7002.1. No action was taken.

Field Blank:

Cyanide was not detected in field blank GDKFW00101. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met. No action was necessary.

VI.) Matrix Spike Recovery (MS):

All MS Recovery criteria were met. No action was necessary.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for cyanide in the field duplicate sample pair analyzed in this fraction of the SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

VALIDATA

Chemical Services, Inc.

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0276
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Total Metals, Cyanide, Diesel Range Organics (DRO), Gasoline Range Organics (GRO)

SDG NUMBER: 8403 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	DRO
161GW00104	8418-02	Water	X	X	
161HW00104	8418-03	Water	X	X	
162GW00104	8403-04	Water	X	+	
162GW00104RE	8403-04RE	Water		X	
162GW00204	8403-05	Water	X	+	
162GW00204RE	8403-05RE	Water		X	
163GW00104	8423-02	Water	X	X	
163HW00104	8423-03	Water	X	X	
166GW00104	8418-01	Water	X	X	
698GW00104	8423-01	Water	X	X	X
698GW00104DL	8423-01DL	Water		+	
GDKGW00104	8408-01	Water	X	+	
GDEGW00104RE	8408-01RE	Water		X	
GDKGW00204	8408-02	Water	X	+	
GDKGW00204RE	8408-02RE	Water		X	
162DW00104	8403-01	Water	X	+	X
162DW00104RE	8403-01RE	Water		X	
162EW00104	8403-02	Water	X	+	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	DRO
162EW00104RE	8403-02RE	Water		X	
162FW00104	8403-03	Water	X	+	X
162FW00104RE	8403-03RE	Water		X	
161TW00104	8418-04	Water	X		
162TW00204	8403-06	Water	X		
163TW00104	8423-04	Water	X		
GDKTW00204	8408-03	Water	X		
166GW00104MS	8418-01MS	Water	+		
166GW00104MSD	8418-01MSD	Water	+		
GDKGW00104MS	8408-01MS	Water	+		
GDKGW00104MSD	8408-01MSD	Water	+		
162EW00104MS	8403-02MS	Water	+		
162EW00104MSD	8403-02MSD	Water	+		
698GW00104MS	8423-02MS	Water			+
698GW00104MSD	8423-02MSD	Water			+
162DW00104MS	8403-01MS	Water			+
162DW00104MSD	8403-01MSD	Water			+

Client Sample #	Lab Sample #	Matrix	GRO	Total Metals	Cyanide
161GW00104	8418-02	Water		X	X
161HW00104	8418-03	Water		X	X
162GW00104	8403-04	Water		X	X
162GW00204	8403-05	Water		X	X
163GW00104	8423-02	Water		X	X
163HW00104	8423-03	Water		X	X
166GW00104	8418-01	Water		X	X
698GW00104	8423-01	Water	X	X	X
GDKGW00104	8408-01	Water		X	X
GDKGW00204	8408-02	Water		X	X
162DW00104	8403-01	Water	X	X	X
162EW00104	8403-02	Water	X	X	X
162FW00104	8403-03	Water	X	X	X
162DW00104MS	8403-01MS	Water	+		+
162DW00104MSD	8403-01MSD	Water	+		
162DW00104MD	8403-01MD	Water			+
698GW00104MS	8423-01MS	Water			+
698GW00104MD	8423-01MD	Water			+
162EW00104MS	8403-02MS	Water		+	
162EW00104MD	8403-02MD	Water		+	
162FW00104MS	8403-03MS	Water		+	
162FW00104MD	8403-03MD	Water		+	

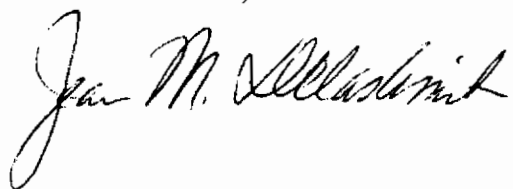
+ = Non-billable analysis

* = Mercury QC analyses only

H = FIELD DUPLICATE, DL = DILUTION, DW = DEIONIZED WATER BLANK,
EB = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, MD = MATRIX DUPLICATE,
MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS,
T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive, flowing style with a large initial "J".

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 8403 Level III CLP Organics & Inorganics

SAMPLES: 161GW00104, 161HW00104, 162GW00104, 162GW00104RE, 162GW00204, 162GW00204RE, 163GW00104, 163HW00104, 166GW00104, 698GW00104, 698GW00104DL, GDKGW00104, GDKGW00104RE, GDKGW00204, GDKGW00204RE, 162DW00104, 162DW00104RE, 162EW00104, 162EW00104RE, 162FW00104, 162FW00104RE, 161TW00104, 162TW00204, 163TW00104, GDKTW00204, 166GW00104MS, 166GW00104MSD, GDKGW00104MS, GDKGW00104MSD, 162EW00104MS, 162EW00104MSD, 162EW00104MD, 698GW00104MS, 698GW00104MSD, 698GW00104MD, 162DW00104MS, 162DW00104MSD, 162DW00104MD, 162FW00104MS, 162FW00104MSD, 162FW00104MD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

Acetone was detected at 3 ug/L and 2 ug/L, respectively, in method blanks VBW1021A and VBLK1022A. Since the field blanks were used for blank qualifications, no further action was necessary.

Field Blanks:

Acetone was detected at 6 ug/L in deionized water blank 162DW00104, 5 ug/L in equipment rinsate blank 162EW00104 and 5 ug/L in field blank 162FW00104. The detections of acetone in the associated samples, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL. The associated samples were 161GW00104, 161HW00104, 162GW00104, 162GW00204, 166GW00104, 698GW00104,

GDKGW00104 and GDKGW00204. In addition, chloroform was detected at 6 ug/L to 7 ug/L in the three field blanks. Since there were no detections of this compound in the associated samples, no further action was taken.

Trip Blanks:

Acetone was detected at 4 ug/L, 6 ug/L and 4 ug/L, respectively, in trip blanks 161TW00104, 162TW00204 and GDKTW00204. Since the field blanks were used for blank qualifications, no further action was necessary.

Chloroform was detected at 7 ug/L in trip blank 163TW00104. This compound was not detected in the associated samples. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this fraction of the SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Two pairs of field duplicate samples (161GW00104 / 161HW00104 and 163GW00104 / 163HW00104) were analyzed in this fraction of the SDG. There were no calculable Relative Percent Differences (RPD's) for the two field duplicate sample pairs. No action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit in the standards analyzed on 10/31/97 on instrument HP7 for the following compounds:

3-nitroaniline	47.6%
2,4-dinitrophenol	48.8%
hexachlorocyclopentadiene	41.7%

There were no detections of these three compounds in the associated samples. No action was necessary.

The Percent Relative Standard Deviation (%RSD) was 44.3% for benzoic acid in the standards analyzed on 11/3/97 on instrument HP5, which exceeded the 30% QC limit. This compound was not detected in the associated samples. No action was required.

The Percent Relative Standard Deviation (%RSD) was 34.4% for 2,4-dinitrophenol in the standards analyzed on 11/4/97 on instrument HP5, which exceeded the 30% QC limit. This compound was not detected in the associated samples. No action was taken.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit in the standard analyzed on 11/3/97 at 10:35 on instrument HP7 for the following compounds:

2,6-dinitrotoluene	73.3%
3-nitroaniline	50.6%
4-nitroaniline	62.6%
carbazole	54.4%
benzo(k)fluoranthene	25.6%

The non-detect results for these compounds in associated samples 161GW00104, 161HW00104 and 166GW00104 were flagged as estimated (UJ).

The Percent Difference (%D) was 31.9% for benzoic acid in the standard analyzed on 11/6/97 at 14:59 on instrument HP5, which exceeded the 25% QC limit. The positive results for this compound in associated samples 163GW00104 and 163HW00104 were flagged as estimated (J).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in method blank EBW1022. Since there were no samples associated with this blank in the SDG, no action was necessary.

Bis(2-ethylhexyl)phthalate was detected at 3 ug/L in method blank EBW1027. All detections of this compound in the associated samples less than 10X the blank amount were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL. The associated samples were 161GW00104, 161HW00104, 163GW00104 and 163HW00104.

Field Blanks:

The reanalyses of the three field blanks were used for validation. Aniline was detected at 1 ug/L in equipment rinsate blank 162EW00104RE but was not detected in any of the associated samples. There were no target compounds detected in the other two field blanks. No action was taken.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) in reanalysis sample GDKGW00204RE were below the QC limits for the following surrogates:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
nitrobenzene-d5	16	35-114%
2-fluorobiphenyl	19	43-116%
2-fluorophenol	14	21-100%

All base/neutral compounds in this sample, which consisted entirely of non-detects, were flagged as estimated (UJ). Since only one acid fraction surrogate was below the QC limits, no further action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Five LCS's were analyzed for this SDG. Eleven LCS recoveries were outside the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VIII.) Field Duplicates:

Two pairs of field duplicate samples (161GW00104 / 161HW00104 and 163GW00104 / 163HW00104) were analyzed in this fraction of the SDG. There were no calculable Relative Percent Differences (RPD's) for the two field duplicate sample pairs. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) in sample 698GW00104 were below the 50-200% QC limits for the following ISTD's:

<u>Internal Standard</u>	<u>%R</u>
1,4-dichlorobenzene-d4	41
naphthalene-d8	41
phenanthrene-d10	45
chrysene-d12	44

All positive and non-detect results for compounds quantitated using these ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

Sample 698GW00104 was originally analyzed at a dilution (698GW00104DL). This dilution analysis was unnecessary. The dilution analysis was not validated as no viable data were produced.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The reanalyses of samples 162GW00104, 162GW00204, GDKGW00104, GDKGW00204 and field blanks 162DW00104, 162DW00104 and 162FW00104 were considered by the validator to be of preferable data quality to the original analyses because of much improved surrogate recoveries. All laboratory data were acceptable with qualifications.

DIESEL RANGE ORGANICS (DRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) TCL Compound Identification:

All criteria were met. No action was taken.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

GASOLINE RANGE ORGANICS (GRO)

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Sample (LCS):

Two LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) TCL Compound Identification:

All criteria were met. No action was taken.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	aluminum	70.7 ug/L	354 ug/L
DWB	antimony	3.50 ug/L	17.5 ug/L
CCB4	barium	0.20 ug/L	1.00 ug/L
CCB4	beryllium	0.50 ug/L	2.50 ug/L
CCB4	cadmium	0.30 ug/L	1.50 ug/L
CCB4	calcium	56.6 ug/L	283 ug/L
CCB4	magnesium	52.0 ug/L	260 ug/L
DWB	manganese	1.20 ug/L	6.00 ug/L
ERB	mercury	0.22 ug/L	1.10 ug/L
DWB	sodium	7410 ug/L	37100 ug/L
DWB	tin	81.4 ug/L	407 ug/L
DWB	zinc	53.6 ug/L	268 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (162DW00104),
ERB = Equipment Rinsate Blank (162EW00104)

All results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, deionized water or equipment rinsate blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB4	arsenic	-4.30 ug/L	21.5 ug/L
CCB4	zinc	-3.00 ug/L	15.0 ug/L

CCB = Continuing Calibration Blank

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
cadmium	2 ug/L
manganese	5 ug/L
potassium	43 ug/L
sodium	37 ug/L
tin	83 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-2 ug/L
barium	-2 ug/L
chromium	-4 ug/L
cobalt	-2 ug/L
copper	-7 ug/L
lead	-3 ug/L
nickel	-7 ug/L
silver	-3 ug/L
vanadium	-1 ug/L
zinc	-2 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Difference (RPD) was 59.1% for zinc in spiked field blank samples 162FW00104 and 162FW00104MD, which exceeded the 20% QC limit for water samples. Since the associated unspiked sample was a field blank, no action was necessary.

VIII.) Matrix Spike Recoveries:

All Matrix Spike Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples (161GW00104 / 161HW00104 and 163GW00104 / 163HW00104) were analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>161GW00104</u>	<u>161HW00104</u>	<u>RPD</u>
aluminum	545 ug/L	802 ug/L	38%
calcium	45600 ug/L	45900 ug/L	0.7%
<u>Analyte</u>	<u>163GW00104</u>	<u>163HW00104</u>	<u>RPD</u>
calcium	6080 ug/L	7150 ug/L	16.2%
iron	599 ug/L	137 ug/L	126%

The RPD's of aluminum in the first field duplicate pair, and iron in the second field pair, exceeded the 30% QC limit for water samples. The detections of these two analytes in their respective field duplicates were flagged as estimated (J).

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0277
CONTRACTED LAB: Ceimic Corporation
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPE OF ANALYSIS: Pesticides / PCB's
SDG NUMBER: 8403-01 (Level III)

SAMPLES:

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Pesticides/ PCB's</u>
161GW00104	8418-02	Water	X
161GW00104RE	8418-02RE	Water	+
161HW00104	8418-03	Water	X
161HW00104RE	8418-03RE	Water	+
162GW00104	8403-04	Water	X
162GW00104RE	8403-04RE	Water	+
162GW00204	8403-05	Water	X
162GW00204RE	8403-05RE	Water	+
163GW00104	8423-02	Water	X
163GW00104RE	8423-02RE	Water	+
163HW00104	8423-03	Water	X
163HW00104RE	8423-03RE	Water	+
166GW00104	8418-01	Water	X
166GW00104RE	8418-01RE	Water	+
698GW00104	8423-01	Water	X
698GW00104RE	8423-01RE	Water	+
GDKGW00104	8408-01	Water	X
GDEGW00104RE	8408-01RE	Water	+
GDKGW00204	8408-02	Water	X
GDKGW00204RE	8408-02RE	Water	+

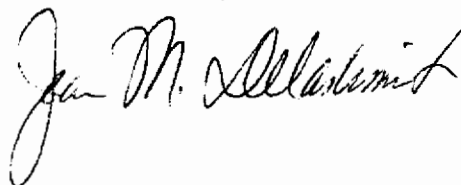
Client	Lab		Pesticides/
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>PCB's</u>
162DW00104	8403-01	Water	X
162DW00104RE	8403-01RE	Water	+
162EW00104	8403-02	Water	X
162EW00104RE	8403-02RE	Water	+
162FW00104	8403-03	Water	X
162FW00104RE	8403-03RE	Water	+

+ = Non-billable analysis

H = FIELD DUPLICATE, DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, RE = REANALYSIS

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - 8403-01 Level III CLP Pesticides and PCB's

SAMPLES: 161GW00104, 161GW00104RE, 161HW00104, 161HW00104RE, 162GW00104, 162GW00104RE, 162GW00204, 162GW00204RE, 163GW00104, 163GW00104RE, 163HW00104, 163HW00104RE, 166GW00104, 166GW00104RE, 698GW00104, 698GW00104RE, GDKGW00104, GDKGW00104RE, GDKGW00204, GDKGW00204RE, 162DW00104, 162DW00104RE, 162EW00104, 162EW00104RE, 162FW00104, 162FW00104RE

PESTICIDES/PCB's

I.) Holding Times:

All reanalysis samples were reextracted 15 to 18 days after sampling date, which exceeded the 7 day QC limit by more than 2X. Since the original sample analyses were used for validation, no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

There were no positive detections in the method or three field blanks. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 168% for tetrachloro-m-xylene (TCX) on the primary column for sample 698GW00104, which exceeded the 30-150% QC limits. The detection of alpha-BHC was flagged as estimated. Since there were no other positive results for this sample, no further action was necessary.

VI.) Laboratory Control Sample (LCS):

Eight LCS's were analyzed by the laboratory. All LCS Percent Recovery criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the two field duplicate sample pairs in this SDG. No action was necessary.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required for this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

The original samples were erroneously extracted for PCB analyses only by using sulfuric acid cleanup. All original samples were reextracted, exceeding holding time limits by more than 2X. All non-detect results for the reanalyses would have been rejected since the Holding Time criterion was exceeded by more than 2X. For that reason, the original analyses were considered by the validator to be of preferable data quality. All original laboratory data were acceptable with one qualification.

VALIDATA

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DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0279
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 or SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics

SDG NUMBER: 32531

SAMPLES:

Client	Lab		Volatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
166GW00203	32544.12	Water	X
166GW00503	32544.14	Water	X
166GW00703	32544.01	Water	X
166HW00703	32544.06	Water	X
166GW00803	32544.08	Water	X
166GW0131A	32531.01	Water	X
166GW0141A	32531.04	Water	X
166GW02D03	32544.13	Water	X
166GW07D03	32544.07	Water	X
166GW07D03DL	32544.07DL	Water	+
166GW08D03	32544.09	Water	X
166GW10D03	32544.14	Water	X
166GW11D03	32544.10	Water	X
166GW12D03	32544.11	Water	X
166GW13D1A	32531.02	Water	X
166GW13D1ADL	32531.02DL	Water	+
166GW14D1A	32531.03	Water	X
166GW14D1ADL	32531.03DL	Water	+
166GW20D1A	32531.05	Water	X
166GW20D1ADL	32531.05DL	Water	+

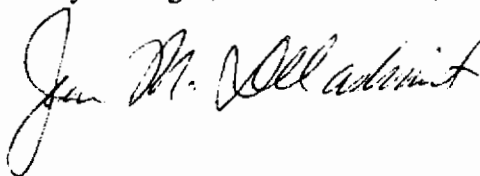
Client	Lab		Volatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
166TW20D1A	32531.06	Water	X
166TW00703	32544.05	Water	X
166EW00703	32544.03	Water	X
166FW00703	32544.04	Water	X
166DW00703	32544.02	Water	X

+ = Non-billable analysis

D = DEIONIZED WATER BLANK, DL = DILUTION, E = EQUIPMENT RINSATE BLANK,
F= FIELD BLANK, H = FIELD DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 32531 CLP Organics

SAMPLES: 166GW00203, 166GW00503, 166GW00703, 166HW00703, 166GW00803,
166GW0131A, 166GW0141A, 166GW02D03, 166GW07D03, 166GW07D03DL,
166GW08D03, 166GW10D03, 166GW11D03, 166GW12D03, 166GW13D1A,
166GW13D1ADL, 166GW14D1A, 166GW14D1ADL, 166GW20D1A,
166GW20D1ADL, 166DW00703, 166EW00703, 166FW00703, 166TW00703,
166TW20D1A

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factor for acetone in the standards analyzed on 1/9/98 on instrument U was 0.040, which was below the 0.050 QC limit. The positive results for this compound in associated samples 166GW07D03 and 166GW14D1A were flagged as estimated (J). The results for all other samples and blanks in this SDG, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factor for acetone in the standards analyzed on 1/26/98 at 11:03 on instrument U was 0.036, which was below the 0.050 QC limit. All results for this compound in the associated samples were previously flagged based on the initial calibration. No further action was required.

The Relative Response Factors for acetone (0.037) and 2-chloroethyl vinyl ether (0.047) were below the 0.050 QC limit for the standards analyzed on 1/27/98 at 09:00 on instrument U. All results for 2-chloroethyl vinyl ether in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 166EW00703, 166GW02D03 and 166GW10D03. No further action was required since the results for acetone were previously flagged based on the initial calibration.

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blanks. No action was required.

Field Blanks:

Chloroform was detected at 7 ug/L in deionized water blank 166DW00703. The positive result for this compound in associated sample 166GW07D03 was flagged as undetected (U) with the result below the CRQL being replaced with the CRQL.

Chloroform was detected at 6 ug/L in equipment rinsate blank 166EW00703. There were no positive results for this compound less than 5X the blank amount. No action was required.

Chloroform was detected at 6 ug/L in field blank 166FW00703. There were no positive results for this compound less than 5X the blank amount. No action was required.

Trip Blanks:

Chloroform was detected at 1 ug/L in trip blank 166TW00703. There were no associated positive sample results for this compound less than 5X the blank amount. No action was required.

Chloroform was detected at 97 ug/L in trip blank 166TW20D1A. All positive results for this compound in the associated samples, less than 5X the blank amount, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL. The associated samples were 166GW13D1A, 166GW14D1A and 166GW20D1A.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of toluene-d8 was 87% in sample 166GW07D03, which was below the 88-110% QC limits. All positive and non-detect results in this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of toluene-d8 (87%) and 1,2-dichloroethane-d4 (79%) in sample 166GW14D1A were below their respective 88-110% and 80-120% QC limits. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several Percent Recoveries were outside their respective QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentrations of trichloroethene in samples 166GW07D03, 166GW13D1A and 166GW14D1A exceeded the standard calibration range. The results for trichloroethene in the three original analyses were replaced by the validator with the dilution analysis results (166GW07D03DL, 166GW13D1ADL and 166GW14D1ADL) and corresponding flags (D).

The concentration of tetrachloroethene in sample 166GW20D1A exceeded the standard calibration range. The result for tetrachloroethene in the original analysis was replaced by the validator with the dilution analysis result (166GW20D1ADL) and corresponding flags (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for acetone in the samples in this SDG were rejected (R) because of a low RRF in the initial calibration. Non-detect results for 2-chloroethyl vinyl ether in blank 166EW00703 and samples 166GW02D03 and 166GW10D03 were rejected (R) because of a low RRF in the associated continuing calibration. All other laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0280
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Volatile Organics, Total Metals

SDG NUMBER: 32368 (Level III)

SAMPLES:

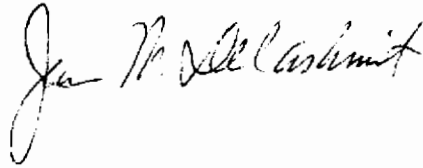
Client Sample #	Lab Sample #	Matrix	Volatile Organics	Total Metals
166GJB0102	32368-07	Water	X	
166GJB0202	32368-03	Water	X	
166GJB0402	32368-02	Water	X	
166GJB0502	32368-05	Water	X	
166GJB0502DL	32368-05DL	Water	+	
166HJB0502	32368-06	Water	X	
166HJB0502DL	32368-06DL	Water	+	
166GSW0102	32368-04	Water	X	
166HSW0102	32368-10	Water	X	
166GSW0202	32368-01	Water	X	
166GSW0302	32368-09	Water	X	
166GSW0402	32368-08	Water	X	
166GSW0502	32368-11	Water	X	
166D001801	32384-02	Water	X	X
166E001801	32384-03	Water	X	X
166P001801	32384-04	Water	X	X
166T001801	32384-01	Water	X	
166TSW0502	32368-12	Water	X	

+ = Non-billable analysis

H = FIELD DUPLICATE, DL = DILUTION, D = DEIONIZED WATER BLANK,
E = EQUIPMENT RINSATE BLANK, P = POTABLE WATER BLANK, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in cursive script, appearing to read "Jean M. Delashmit". The signature is written in dark ink and is positioned to the right of the "RELEASE SIGNATURE:" label.

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 32368 Level III CLP Organics and Inorganics

SAMPLES: 166GJB0102, 166GJB0202, 166GJB0402, 166GJB0502, 166GJB0502DL,
166HJB0502, 166HJB0502DL, 166GSW0102, 166HSW0102, 166GSW0202,
166GSW0302, 166GSW0402, 166GSW0502, 166D001801, 166E001801,
166P001801, 166T001801, 166TSW0502

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factor (RRF) was 0.029 for acetone in the standards analyzed on 1/2/98 on instrument U, which was below the 0.050 QC limit. All results for this compound in the associated samples and blanks, which consisted entirely of non-detects, were rejected (R). The associated samples were 166GJB0102, 166GJB0202, 166GJB0402, 166GJB0502, 166HJB0502, 166GSW0102, 166HSW0102, 166GSW0202, 166GSW0302, 166GSW0402, 166GSW0502 and trip blank 166TSW0502.

The average Relative Response Factor (RRF) was 0.041 for acetone in the standards analyzed on 1/9/98 on instrument U, which was below the 0.050 QC limit. The non-detect result for acetone in trip blank 166T001801 was rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) was 0.035 for acetone in the standard analyzed on 1/7/98 at 0946 on instrument U, which was below the 0.050 QC limit. Since all results for acetone in the associated samples were previously rejected based on the initial calibration, no further action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the two method blanks. No action was necessary.

Field Blanks:

Acetone was detected at 17 ug/L and 46 ug/L, respectively, in deionized water blank 166D001801 and equipment rinsate blank 166E001801. In addition, 1,2-dichloropropane was detected at 1 ug/L in deionized water blank 166D001801. Since there were no detections of these two compounds in the associated samples, no action was taken.

The following compounds were detected in potable water blank 166P001801:

acetone	100 ug/L
chloroform	40 ug/L
1,2-dichloropropane	2 ug/L
bromodichloromethane	5 ug/L
toluene	1 ug/L

These compounds were not detected in the associated samples. No action was required.

Trip Blanks:

There were no positive detections in the two trip blanks. No action was necessary.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this fraction of the SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Two pairs of field duplicate samples (166GHB0502 / 166HJB0502 and 166GSW0102 / 166HSW0102) were analyzed in this fraction of the SDG. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>166GJB0502</u>	<u>166HJB0502</u>	<u>RPD</u>
trichloroethene	160 ug/L	180 ug/L	12%
tetrachloroethene	10 ug/L	10 ug/L	0%

<u>Compound</u>	<u>166GSW0102</u>	<u>166HSW0102</u>	<u>RPD</u>
trichloroethene	48 ug/L	47 ug/L	2.2%
tetrachloroethene	60 ug/L	56 ug/L	6.9%

Since all RPD's were within the 30% QC limit for water samples, no action was necessary.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentration of trichloroethene in samples 166GJB0502 and 166HJB0502 exceeded the linear standard calibration range. The result for this compound in the original analyses were replaced by the validator with the dilution analysis results (166GJB0502DL and 166HJB0502DL) and corresponding flags (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acetone were rejected in eleven water samples and two trip blanks. All remaining laboratory data were acceptable with qualification.

TOTAL METALS

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PWB	aluminum	2310 ug/L	11600 ug/L
PWB	barium	80.4 ug/L	402 ug/L
PWB	beryllium	0.33 ug/L	1.65 ug/L
PWB	calcium	30000 ug/L	150000 ug/L
PWB	chromium	1.10 ug/L	5.50 ug/L
PWB	copper	11.0 ug/L	55.0 ug/L
PWB	iron	1560 ug/L	7800 ug/L
EWB	lead	46.8 ug/L	234 ug/L
PWB	magnesium	1080 ug/L	5400 ug/L
PWB	manganese	67.8 ug/L	339 ug/L
DWB	mercury	0.12 ug/L	0.60 ug/L
PWB	nickel	2.20 ug/L	11.0 ug/L
PWB	potassium	1640 ug/L	8200 ug/L
PBW	silver	1.40 ug/L	7.00 ug/L
PWB	sodium	7620 ug/L	38100 ug/L
EWB	tin	14.7 ug/L	73.5 ug/L
PWB	vanadium	1.40 ug/L	7.00 ug/L
PWB	zinc	64.3 ug/L	322 ug/L

DWB = Distilled Water Blank (166D001801), EWB = Equipment Rinsate Blank (166E001801),
PBW = Preparation Blank (Water), PWB = Potable Water Blank (166P001801)

Since all associated samples were field blanks, no action was taken.

The following analytes had negative results with absolute values greater than the IDL in the continuing calibration blanks (CCB's):

<u>Blank ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB1	magnesium	-68.4 ug/L	342 ug/L
CCB3	silver	-1.60 ug/L	8.00 ug/L

Since all associated samples were field blanks, no action was taken.

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	7 ug/L
cobalt	1 ug/L
lead	3 ug/L

selenium	4 ug/L
sodium	44 ug/L
vanadium	2 ug/L

These analytes should not be present. Additionally, negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-3 ug/L
barium	-1 ug/L
nickel	-2 ug/L

All associated samples were field blanks. No action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VIII.) Matrix Spike Recoveries:

Matrix Spike Recovery samples were not analyzed in this SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

VALIDATA

Chemical Services, Inc.

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(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0281
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994
SAMPLE MATRIX: Water
TYPES OF ANALYSIS: Volatile Organics
SDG NUMBER: 32558 (Level III)


SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Volatile</u> <u>Organics</u>
166GW01501	32591.01	Water	X
166GW01601	32591.03	Water	X
166GW01601DL	32591.03DL	Water	+
166HW01701	32591.05	Water	X
166GW01901	32558.01	Water	X
166GW02101	32558.03	Water	X
166GW15D01	32591.02	Water	X
166GW16D01	32591.04	Water	X
166GW16D01DL	32591.04DL	Water	+
166GW17D01	32591.06	Water	X
166GW19D01	32591.02	Water	X
166GW21D01	32558.04	Water	X
166TW17D01	32544.01	Water	X
166TW21D01	32544.05	Water	X

+ = Non-billable analysis

DL = DILUTION, H = FIELD DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE: 

Data Qualifier Definitions

- J - The associated numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 32558 Level III CLP Organics and Inorganics

SAMPLES: 166GW01501, 166GW01601, 166GW01601DL, 166GW01701, 166GW01901,
166GW02101, 166GW15D01, 166GW16D01, 166GW16D01DL, 166GW17D01,
166GW19D01, 166GW21D01, 166TW17D01, 166TW21D01

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factor (RRF) was 0.041 for acetone in the standards analyzed on 1/9/98 on instrument U, which was below the 0.050 QC limit. All results for this compound in all SDG samples and trip blanks, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) were 0.030 and 0.039, respectively, for acetone and 2-chloroethyl vinyl ether in the standard analyzed on 1/28/98 at 0840 on instrument U, which were below the 0.050 QC limit. All results for acetone in the associated samples were previously rejected based on the initial calibration. All results for 2-chloroethyl vinyl ether in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 166GW01901, 166GW19D01, 166GW02101, 166GW21D01 and trip blank 166TW21D01.

The Percent Difference (%D) for 2-chloroethyl vinyl ether was 38.0% in the standard analyzed on 1/28/98 at 0840 on instrument U, which exceeded the 25% QC limit. Since the non-detect results for this compound in the associated samples were previously rejected because of a low RRF in this calibration, no further action was necessary.

The Relative Response Factor (RRF) was 0.035 for acetone in the standard analyzed on 1/29/98 at 1317 on instrument U, which was below the 0.050 QC limit. All results for acetone in the associated samples were previously rejected based on the initial calibration. No further action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the three method blanks. No action was necessary.

Trip Blanks:

The following compounds were detected in trip blank 166TW17D01:

chloroform	130 ug/L
bromodichloromethane	25 ug/L
dibromochloromethane	5 ug/L
trichloroethene	1 ug/L

The detections of chloroform and trichloroethene in associated samples 166GW01501, 166GW01601, 166GW16D01 and 166GW17D01, which were less than 5X the blank amounts, were flagged as undetected (U) with results less than the CRQL being raised to the CRQL. Since bromodichloromethane and dibromochloromethane were not detected in the associated samples, no further action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Several LCS Recoveries were outside the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentrations of trichloroethene in samples 166GW01601 and 166GW16D01 exceeded the linear standard calibration range. The results for this compound in the original analyses were replaced by the validator with the dilution analysis results (166GW01601DL and 166GW16D01DL) and corresponding flags (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acetone were rejected in ten water samples and two trip blanks. In addition the non-detect results for 2-chloroethyl vinyl ether were rejected in four water samples and one trip blank. All remaining laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0282
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHOD: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: *USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994*

SAMPLE MATRIX: Water
TYPES OF ANALYSES: Total Volatiles

SDG NUMBER: 32606

Client	Lab		Volatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
166GJB0103	32606.10	Water	X
166GJB0203	32606.11	Water	X
166GJB0403	32606.12	Water	X
166GJB0503	32606.13	Water	X
166GJB0503DL	32606.13DL	Water	+
166HJB0503	32606.14	Water	X
166HJB0503DL	32606.14DL	Water	+
166GSW0103	32606.09	Water	X
166GSW0203	32606.06	Water	X
166GSW0303	32606.18	Water	X
166GSW0403	32606.07	Water	X
166GSW0503	32606.05	Water	X
166GW01801	32606.01	Water	X
166HW01801	32606.02	Water	X
166GW02001	32606.17	Water	X
166GW18D01	32606.03	Water	X
166FJB0503	32606.15	Water	X
166TW01801	32606.16	Water	X
166EW01801	32606.04	Water	X
166DW01801	32606.05	Water	X

+ Non-billable analysis

D = DEIONIZED WATER BLANK, DL = DILUTION, E = EQUIPMENT RINSATE BLANK,
F= FIELD BLANK, H = FIELD DUPLICATE, T = TRIP BLANK

DATA REVIEWER(S): Amy L. Hogan, Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

A handwritten signature in cursive script, reading "Jean M. Delashmit". The signature is written in dark ink and is positioned to the right of the "RELEASE SIGNATURE:" label.

Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 32606 CLP Organics

SAMPLES: 166GJB0103, 166GJB0203, 166GJB0403, 166GJB0503, 166GJB0503DL, 166HJB0503, 166HJB0503DL, 166GSW0103, 166GSW0203, 166GSW0303, 166GSW0403, 166GSW0503, 166GW01801, 166HW01801, 166GW02001, 166GW18D01, 166TW01801, 166EW01801, 166DW01801, 166FJB0503

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factor (RRF) was 0.040 for acetone in the standards analyzed on 1/9/98 on instrument U, which was below the 0.050 QC limit. All results for this compound in the samples and blanks in this SDG, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) was 0.032 for acetone in the standard analyzed on 2/01/98 at 08:01 on instrument U, which was below the 0.050 QC limit. All results for this compound in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Difference (%D) was 33.3% for 2-chloroethyl vinyl ether in the standard run on 2/01/98 at 08:01 on instrument U, which exceeded the 25% QC limit. All results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 166GW18D01, 166GSW0103, 166GJB0103, 166GJB0203, 166GJB0503, 166HJB0503 and 166GSW0303.

The Relative Response Factor (RRF) for acetone was 0.034, which was below the 0.050 QC limit, for the standards analyzed on 2/02/98 at 09:35 on instrument U. Since the results for acetone were previously rejected based on the initial calibration, no further action was required.

IV.) Blanks:

Method Blanks:

There were no detections in the associated method blanks. No action was required.

Field Blanks:

Chloroform was detected at 13 ug/L in deionized water blank 166DW01801, at 16 ug/L in equipment rinsate blank 166EW01801, and at 5 ug/L in field blank 166FJB0503. There were no positive results for this compound in the associated samples. No action was required.

Trip Blanks:

Chloroform was detected at 1 ug/L in trip blank 166TW01801. There were no positive results for this compound in the associated samples. No action was required.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 1,2-dichloroethane-d4 was 79% for sample 166GJB0503, which was below the 80-120% QC limits. All positive and non-detect results for the compounds in this sample were flagged as estimated (J) and (UJ).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. Several LCS Percent Recoveries (%R's) were outside their respective QC limits. Data validation action based on LCS criteria was not required.

VIII.) Field Duplicates:

There were two sets of field duplicate samples analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>166GJB0503</u>	<u>166HJB0503</u>	<u>RPD</u>
1,2-dichloroethene	12 ug/L	13 ug/L	8%
trichloroethene	170 ug/L	170 ug/L	0%
tetrachloroethene	10 ug/L	10 ug/L	0%

<u>Compound</u>	<u>166GW01801</u>	<u>166HW01801</u>	<u>RPD</u>
trichloroethene	2 ug/L	2 ug/L	0%
tetrachloroethene	44 ug/L	81 ug/L	59%

The RPD for tetrachloroethene exceeded the 30% QC limit for water samples in the second set of field duplicates. The positive results for this compound in associated samples 166GW01801 and 166HW01801 were flagged as estimated (J).

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The concentration of trichloroethene in samples 166GJB0503 and 166HJB0503 exceeded the linear standard calibration range. The results for this compound in the original analyses were replaced by the validator with the dilution analysis results (166GJB0503DL and 166HJB0503DL) and corresponding flags (D).

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met . No action was necessary.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for acetone in the samples and blanks in this SDG were rejected (R) because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe / Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0283
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVEL: EPA Level III
EPA METHODS: EPA SOW 3-90 / SW-846
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994
SAMPLE MATRICES: Soil and Water
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Total Metals, Cyanide
SDG NUMBER: 32413 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Total Metals	Cyanide
166GW00303	32470-01	Water	X			
166GW00403	32470-07	Water	X			
166GW00603	32470-08	Water	X			
166GW03D03	32470-05	Water	X			
166GW04D03	32470-09	Water	X			
166GW05D03	32477-01	Water	X			
166HW05D03	32477-02	Water	X			
166GW06D03	32470-10	Water	X			
166GW09D03	32477-03	Water	X			
694GW00403	32413-01	Water	X	X	X	X
1666020D01	32470-11	Soil	X		X	
166DW00303	32470-02	Water	X			
166EW00303	32470-03	Water	X			
166FW00303	32470-04	Water	X			
166DW20D01	32470-14	Water	X			
166EW20D01	32470-12	Water	X		X	
166PW20D01	32470-13	Water	X		X	
166TW00303	32470-06	Water	X		X	
166TW05D03	32477-04	Water	X			
166TW20D01	32470-15	Water	X			
694TW00403	32413-02	Water	X			

Client	Lab		Volatile	Semi-	Total	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>Metals</u>	<u>Cyanide</u>
694GW00403MS	32413-01MS	Water		+		
694GW00403MSD	32413-01MSD	Water		+		

+ = Non-billable analysis

4th Digit Codes:

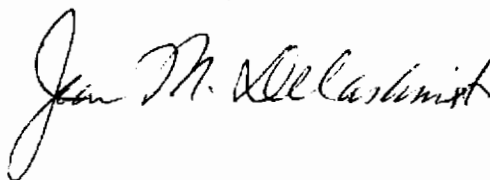
6 = SAND BLANK, D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK,
F = FIELD BLANK, H = FIELD DUPLICATE, P = POTABLE WATER BLANK, T = TRIP BLANK

Suffix Codes:

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:



Data Qualifier Definitions

- J - The association numerical value is an estimated quantity.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 32413 Level III CLP Organics and Inorganics

SAMPLES: 1666020D01, 166GW00303, 166GW00403, 166GW00603, 166GW03D03, 166GW04D03, 166GW05D03, 166HW05D03, 166GW06D03, 166GW09D03, 694GW00403, 166DW00303, 166EW00303, 166FW00303, 166DW20D01, 166EW20D01, 166PW20D01, 166TW00303, 166TW05D03, 166TW20D01, 694TW00403, 694GW00403MS, 694GW00403MSD

VOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) were 0.044 and 0.027, respectively, for acetone and 2-chloroethyl vinyl ether in the standards analyzed on 1/26/98 on instrument R, which were below the 0.050 QC limit. The non-detect results for the two compounds in associated sand blank 1666020D01 were rejected (R).

The average Relative Response Factor (RRF) was 0.041 for acetone in the standards analyzed on 1/9/98 on instrument U, which was below the 0.050 QC limit. The results for acetone in all SDG water samples, field blanks (except 166DW20D01) and trip blanks, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) were 0.036 and 0.045, respectively, for acetone and 2-chloroethyl vinyl ether in the standard analyzed on 1/13/98 at 0958 on instrument U, which were below the 0.050 QC limit. The non-detect results for 2-chloroethyl vinyl ether in sample 694GW00403 and trip blank 694TW00403 were rejected (R). Since the results for acetone in the two samples were previously rejected based on the initial calibration, no further action was taken.

The Percent Difference (%D) was 28.6% for 2-chloroethyl vinyl ether in the standard analyzed on 1/13/98 at 0958 on instrument U, which exceeded the 25% QC limit. Since the results for this compound in the associated samples were previously rejected based on a low RRF in this calibration,

no further action was necessary.

The Relative Response Factor (RRF) was 0.035 for acetone in the standard analyzed on 1/19/98 at 13:06 on instrument U, which was below the 0.050 QC limit. All results for acetone in the associated water samples were previously rejected based on a low RRF in the initial calibration. No further action was required.

The Relative Response Factor (RRF) was 0.037 for acetone in the standard analyzed on 1/20/98 at 10:03 on instrument U, which was below the 0.050 QC limit. All results for acetone in the associated water samples were previously rejected based on a low RRF in the initial calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the four method blanks. No action was necessary.

Field Blanks:

Chloroform was detected at 6 ug/L each in deionized water blank 166DW00303, equipment rinsate blank 166EW00303 and field blank 166FW00303. Chloroform was also detected at 30 ug/L in potable water blank 166PW20D01. Since there were no detections of this compound in the associated samples, no action was taken. In addition, bromodichloromethane was detected at 7 ug/L in potable water blank 166PW20D01 and acetone was detected at 3 ug/L in deionized water blank 166DW20D01. These compounds were not detected in the associated samples. No action was required.

Trip Blanks:

Chloroform was detected at 1 ug/L each in trip blanks 166TW00303, 166TW20D01 and 694TW00403. This compound was not detected in the associated samples. No action was taken.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Eight LCS's were analyzed in this fraction of the SDG. Twenty-four LCS Percent Recoveries (%R's) were outside QC limits. Data validation action based on LCS's was not required. No action was taken.

VIII.) Field Duplicates:

One pair of field duplicate sample, 166GW05D03 / 166HW05D03, was analyzed in this SDG. The only calculable Relative Percent Difference (RPD) was:

<u>Compound</u>	<u>166GW05D03</u>	<u>166HW05D03</u>	<u>RPD</u>
trichloroethene	37 ug/L	37 ug/L	0%

Since the RPD was within the 30% QC limit for water samples, no action was necessary.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acetone were rejected in all SDG samples and blanks because of low RRF's in the initial calibrations. The non-detect results for 2-chloroethyl vinyl ether were rejected in one sample, one trip blank, and the sand blank because of low RRF's in the associated initial and continuing calibrations. All remaining laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met. No action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no detections in the method blank. No action was taken.

Tentatively Identified Compounds (TIC's):

There were no TIC's detected in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of 4-nitrophenol were 95% and 92%, respectively, in spiked samples 694GW00403MS and 694GW00403MSD, which exceeded the 10-80% QC limits. Since this compound was not detected in the associated unspiked sample, no action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met. No action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met. No action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

TOTAL METALS AND CYANIDE

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level	
			ug/L	mg/kg
PBW	aluminum	157 ug/L	785	157
CCB9	antimony	4.00 ug/L	20.0	4.00
CCB3	arsenic	4.50 ug/L	22.5	4.50
PBW	barium	15.2 ug/L	76.0	15.2
CCB7	beryllium	0.30 ug/L	1.50	0.30
PBW	calcium	26700 ug/L	134000	26700
PBS	chromium	0.08 mg/kg	0.08	0.40
PBS	cobalt	0.14 mg/kg	0.14	0.70
PBW	copper	5.10 ug/L	25.5	5.10
PBW	iron	925 ug/L	4630	925
ERB	lead	16.2 ug/L	81.0	16.2
PBW	magnesium	762 ug/L	3810	762
PBW	manganese	14.9 ug/L	74.5	14.9
PBW	nickel	2.20 ug/L	11.0	2.20
PBW	potassium	1600 ug/L	8000	1600
PBW	sodium	4250 ug/L	21300	4250
PBW	vanadium	1.40 ug/L	7.00	1.40
PBW	zinc	57.5 ug/L	288	57.5
PBW	cyanide	2.47 ug/L	12.4	2.47

CCB = Continuing Calibration Blank, ERB = Equipment Rinsate Blank (166EW20D01), PBW = Preparation Blank (Water), PBS = Preparation Blank (Soil), PBW = Potable Water Blank (166PW20D01)

All results greater than the IDL but less than 5X the blank amounts (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, field or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Max. Conc.	Action Level	
			ug/L	mg/kg
ICB	aluminum	-13.2 ug/L	66.0	13.2
CCB3	lead	-1.50 ug/L	7.50	1.50
PBW	potassium	-141 ug/L	705	141

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were detected in ICS Solution A at concentrations greater than the IDL:

antimony	5 ug/L
arsenic	9 ug/L
barium	5 ug/L
chromium	3 ug/L
cobalt	1 ug/L
lead	5 ug/L
sodium	256 ug/L
thallium	11 ug/L

These analytes should not be present. Additionally, negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

cadmium	-1 ug/L
cobalt	-1 ug/L
lead	-1 ug/L
manganese	-4 ug/L
nickel	-21ug/L
potassium	-546 ug/L
selenium	-3 ug/L
sodium	-54 ug/L
vanadium	-2 ug/L
zinc	-9 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) was 222% for zinc in soil dilution sample 1666020D01L, which exceeded the 10% QC limit. Zinc was not detected in associated sand blank, 1666020D01. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was taken.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was necessary.

VIII.) Matrix Spike Recoveries:

Matrix Spike Recovery samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall
SITE NAME: Charleston Naval Base, Zone K
SERVICE ORDER NUMBER: 0283
CONTRACTED LAB: Southwest Laboratories of Oklahoma, Inc.
EPA SOW/METHOD: EPA 8290
VALIDATION GUIDELINES: EPA 8290, Professional Judgement
SAMPLE MATRIX: Water
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

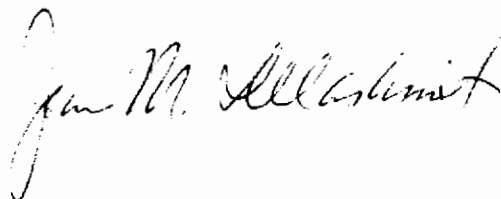
SDG NUMBER: 32413 (Level III)

SAMPLES:

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
694GW00403	32413.01	Water	X

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:



DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 32413 2,3,7,8-substituted PCDD's and PCDF's

SAMPLE: 694GW00403

2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S

I.) Holding Times:

All criteria were met, so no action was taken.

II.) HRGC/HRMS System Performance:

GC Column Performance:

All criteria were met, so no action was taken.

HRMS Resolution:

All criteria were met, so no action was required.

Mass Verification:

All criteria were met, so no action was taken.

MS Data Acquisition:

All criteria were met, so no action was taken.

III.) Calibration:

Calibration Range:

All criteria were met, so no action was taken.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

OCDD was detected in method blank DFBLK1 at 3.5 pg/L. The detection of OCDD in the associated sample below 5X the blank amount (18 pg/L) was flagged as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 694DW00203, equipment rinsate blank 694EW00203 and field blank 694FW00203 collected on 12/17/97 were analyzed in SDG 32259. OCDD was detected in the blanks at the following highest concentration:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
694DW00203	OCDD	50.7 pg/L	254 pg/L

Detections of OCDD in the associated samples below 5X the blank amount were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed. No action was taken.

VII.) Duplicates:

No field duplicates set was analyzed. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications.

SWMU 166
TCE Plume Investigation
Onsite Laboratory Analytical Data
for DPT Samples



**SOIL SAMPLING
ANALYTICAL RESULTS
GAS CHROMATOGRAPH**

**CHARLESTON NAVAL BASE
PROJECT NO. 7124.02**

Prepared For:

**Ensafe/Allen & Hoshall
Mt. Pleasant Business Park
935 Houston Northcutt Blvd. Suite 113
Charleston, SC 29464**

MARCH 1997

Prepared By:

**Alpha Environmental Sciences, Inc.
367 Dellwood, Bldg. A, Suite 2
P.O. Box 31
Waynesville, North Carolina**



VIA TELECOPY - (901) 383-1743

March 27, 1997

Mr. Britton Dotson
EnSafe/Allen & Hoshall
Mt. Pleasant Business Park
935 Houston Northcutt Blvd - Suite 113
Charleston, SC 29464

**RE: Soil Sampling Analytical Results - March 1997
Charleston Naval Base - Project No. 7124.02**

Mr. Dotson:

Alpha Environmental Sciences, Inc. has compiled the analytical results of the soil sampling conducted at the above referenced site. The results of our investigation are contained in the final report which follows.

I am available to answer any questions at your convenience, Thank you for this opportunity to be of service.

Sincerely,

Alpha Environmental Sciences, Inc.

A handwritten signature in black ink, appearing to read "Terry LaDuke", with a stylized flourish at the end.

Terry L. LaDuke, VP

TLL/sm

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP03711	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP03724	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	391
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP03735	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP03811	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP03824	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP03836	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	180
	Cis-1,2-Dichloroethylene	1116
	Vinyl Chloride	2486
166GP03911	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	14957
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP03924	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	10
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	681
166GP03934	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	40
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04111	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04124	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04133	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	954
166GP04211	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	598
	Vinyl Chloride	214
166GP04224	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	375
Trans-1,2-Dichloroethylene		BDL - < 5.0 ppb
Trichloroethylene		BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene		BDL - < 5.0 ppb
Vinyl Chloride		BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP04234	Trans-1,2-Dichloroethylene	17
	Trichloroethylene	288
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04510	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04526	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	22
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1639
166GP04535	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04610	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04626	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	167
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04636	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	846

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP04710	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04726	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	6149
	Vinyl Chloride	BDL
166GP04736	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04811	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04824	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP04834	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	75
	Cis-1,2-Dichloroethylene	704
	Vinyl Chloride	BDL
166GP04910	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	300

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

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<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP04926	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	59
	Cis-1,2-Dichloroethylene	9374
	Vinyl Chloride	BDL
166GP04935	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	99
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP05111	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1227
166GP05124	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	925
166GP05133	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	699
166GP05210	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	216
166GP05226	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	36
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP05236	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	476
166GP05311	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	832
166GP05324	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1011
166GP05333	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	137765
	Vinyl Chloride	BDL
166GP05411	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1825
166GP05424	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	610
	Cis-1,2-Dichloroethylene	85858
	Vinyl Chloride	BDL
166GP05433	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	4709
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP05511	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	6
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1356
166GP05524	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP05534	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	162
166GP05811 (poly tubing)	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	718
	Cis-1,2-Dichloroethylene	660
	Vinyl Chloride	4435
166GP05811 (teflon tubing)	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	624
	Cis-1,2-Dichloroethylene	636
	Vinyl Chloride	3804
166GP05824	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP05834	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	2052

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP05911	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP05924	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1082
166GP05934	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1242
166GP06011	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	8
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	454
166GP06024	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1307
166GP06034	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP06124	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1008

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 27, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
166GP06133	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	1582
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP06211	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP06224	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP06234	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	310
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP06311	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	1301
166GP06324	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	20
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
166GP06333	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	43583
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Raw data file created: 03/17/97 4:30p
 Detection results file created: 03/17/97 4:30p
 Final results file created: 03/17/97 4:30p

Name: Charleston Naval Base
 (ment:

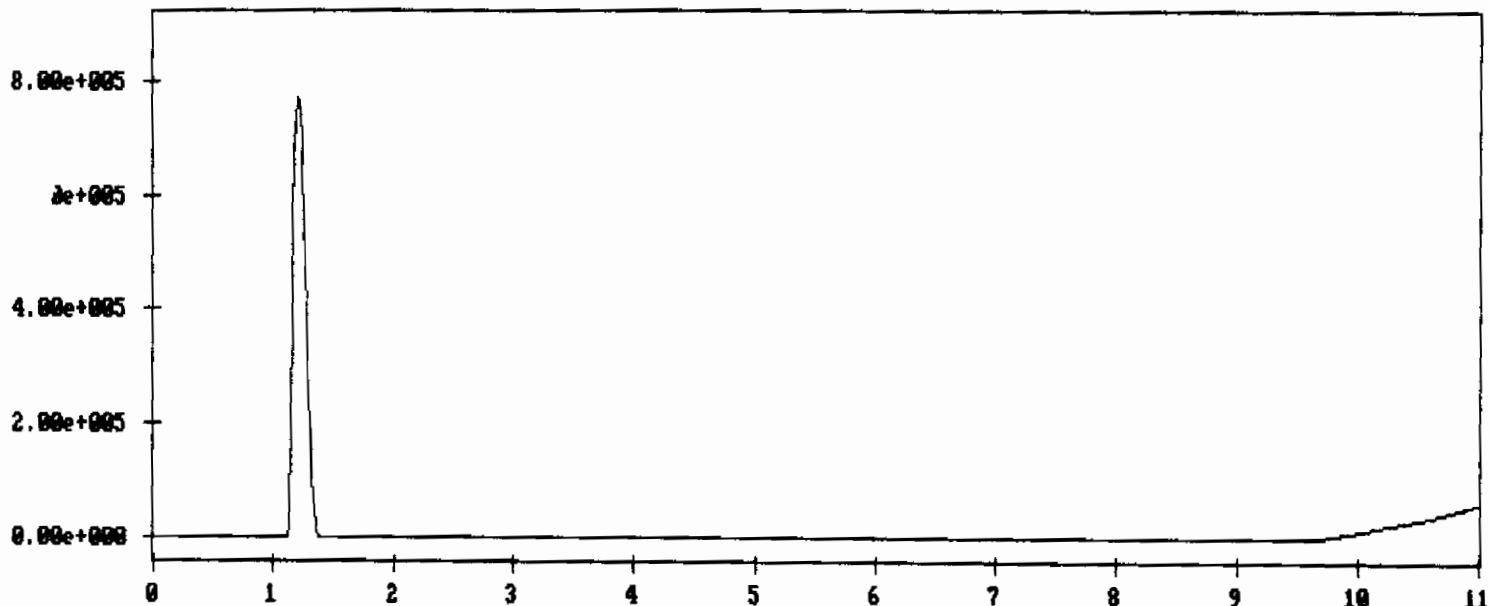
Acquisition method: C-VOL-MX

Sample name : 166GP04710
 Vial ID : 01
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/17/97 6:00p
 Detection results file created: 03/17/97 6:15p
 Final results file created: 03/17/97 6:15p

Name: Charleston Naval Base
 Comment:

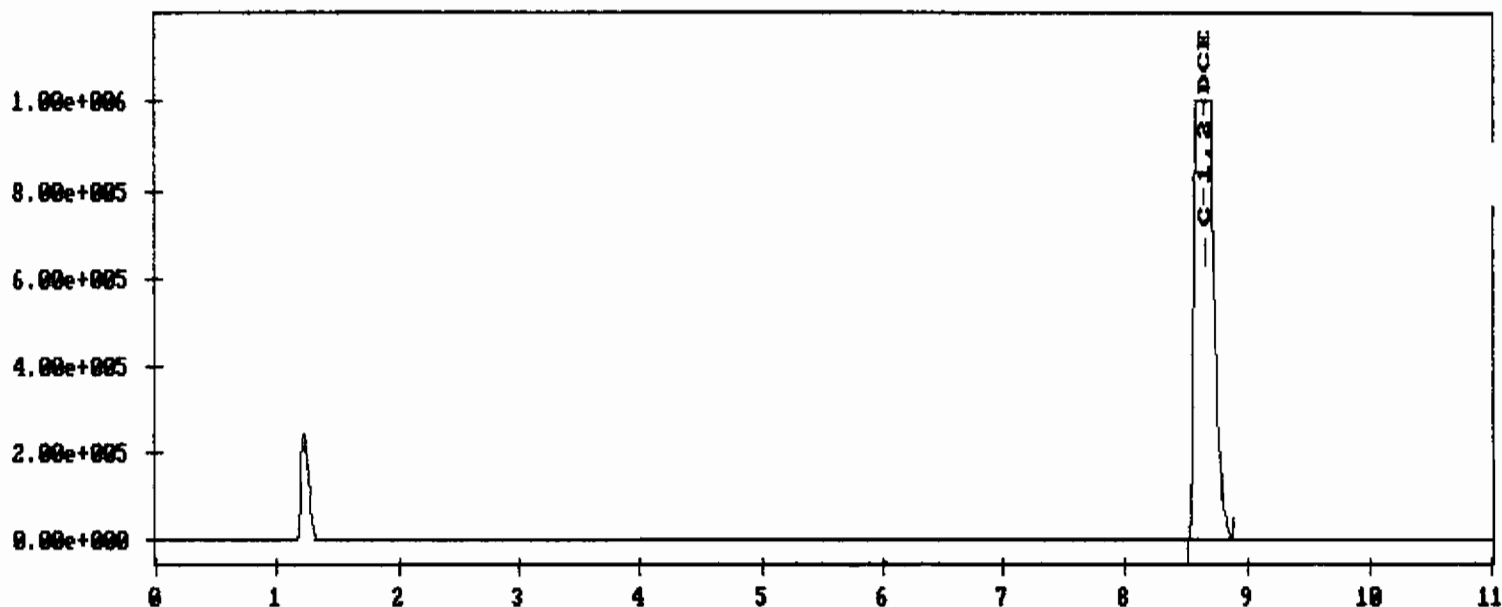
Acquisition method: C-VOL-MX

Sample name : 166GP04726-B
 Vial ID : 02
 Injection volume : 100.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 5.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
8.650	C-1,2-DCE	6148.978516	11243074.0	999968.000
		6148.978516	11243074.0	999968.000

Raw data file created: 03/17/97 5:41p
 Detection results file created: 03/17/97 5:41p
 Final results file created: 03/17/97 5:41p



Name: Charleston Naval Base
 (ment:

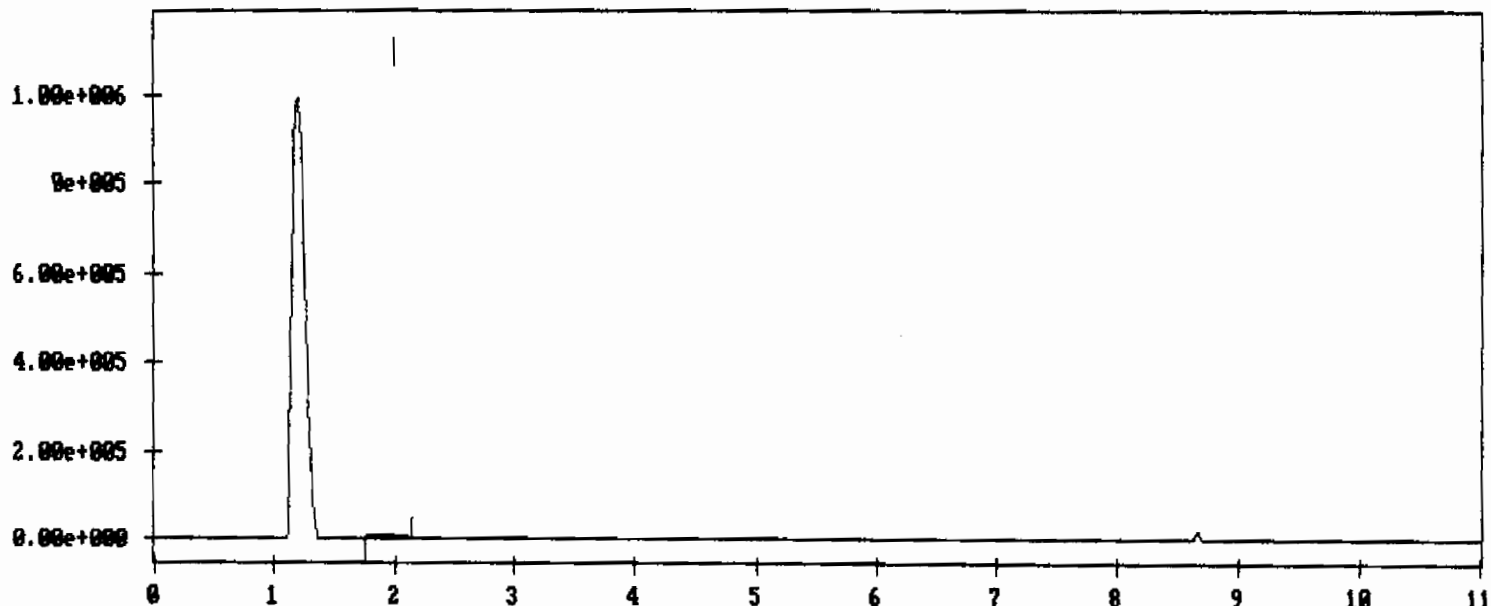
Acquisition method: C-VOL-MX

Sample name : 166GP04736
 Vial ID : 03
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/18/97 1:55p

Detection results file created: 03/18/97 1:56p

Final results file created: 03/18/97 1:56p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04910

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

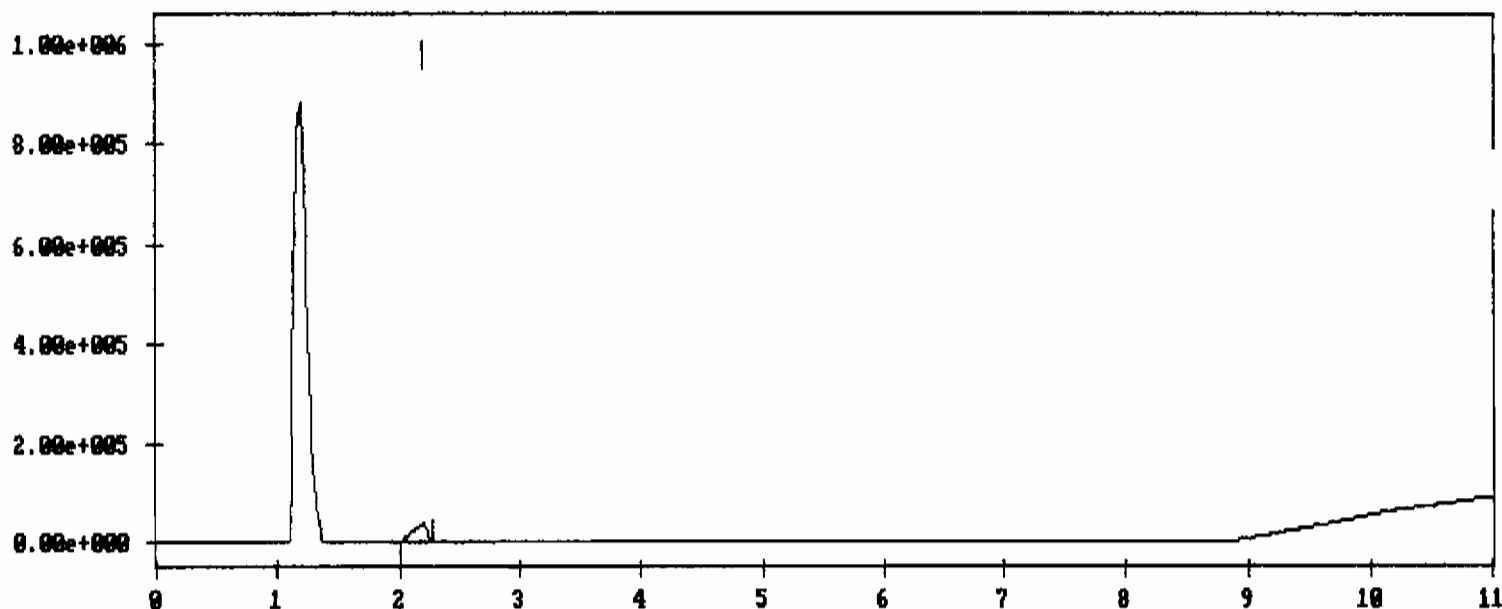
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 9:00a
 Detection results file created: 03/19/97 9:01a
 Final results file created: 03/19/97 9:14a

Name: Charleston Naval Base
 (ment:

Acquisition method: C-VOL-MX

Sample information modified: 03/19/97 9:14a

	Current Sample Information	Original Sample Information
Sample name	: 166GP04926-C	166GP04926-C
Vial ID	: 02-A	02-A
Injection volume	: 250.0000	250.0000
IS amount (Sample)	: 0.000000	0.000000
Sample amount	: 1.000000	1.000000
Dilution factor	: 8.000000	4.000000

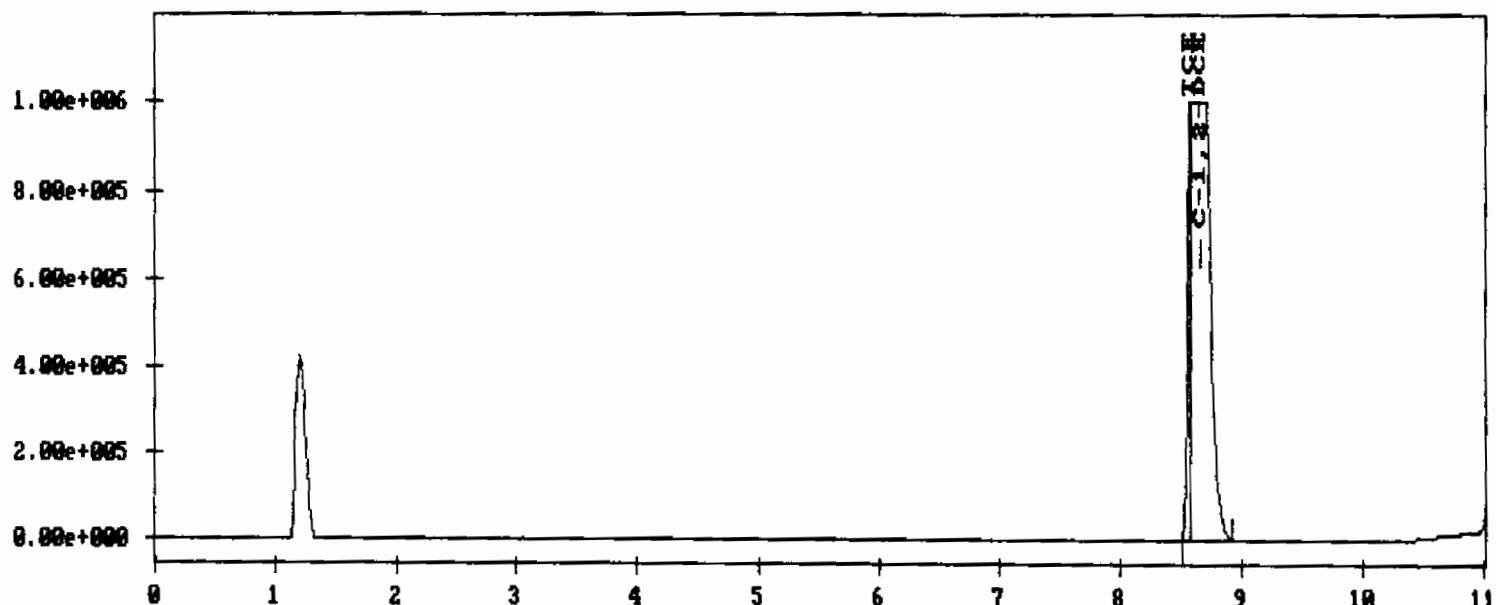
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.565	TCE	58.777573	1882270.25	999968.000

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
8.650	C-1,2-DCE	9373.674805	10712036.0	999968.000
		9432.452148	12594306.0	1999936.00

Raw data file created: 03/18/97 3:10p
 Detection results file created: 03/18/97 3:11p
 Final results file created: 03/18/97 3:11p

Name: Charleston Naval Base
 (ment:

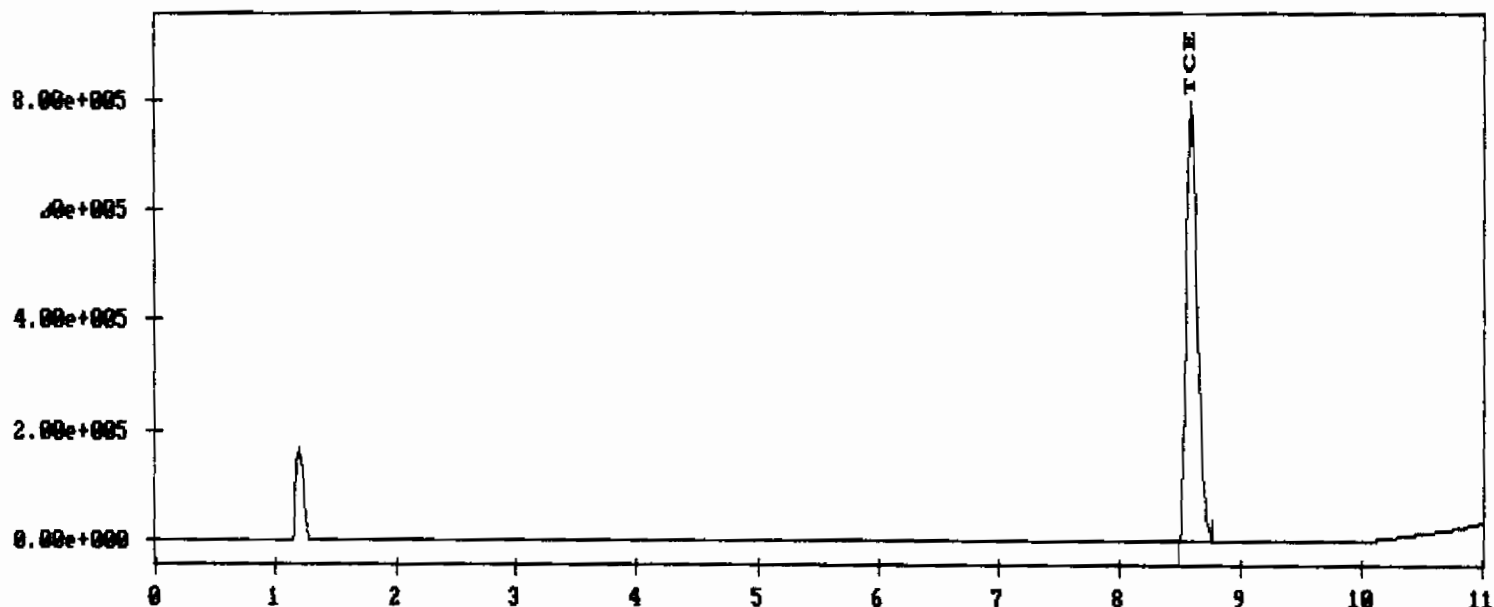
Acquisition method: C-VOL-MX

Sample name : 166GP04935-A
 Vial ID : 03
 Injection volume : 100.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 5.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.586	TCE	98.806625	5062632.50	798386.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		98.806625	5062632.50	798386.000

Raw data file created: 03/18/97 3:28p

Detection results file created: 03/18/97 3:28p

Final results file created: 03/18/97 3:28p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04610

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

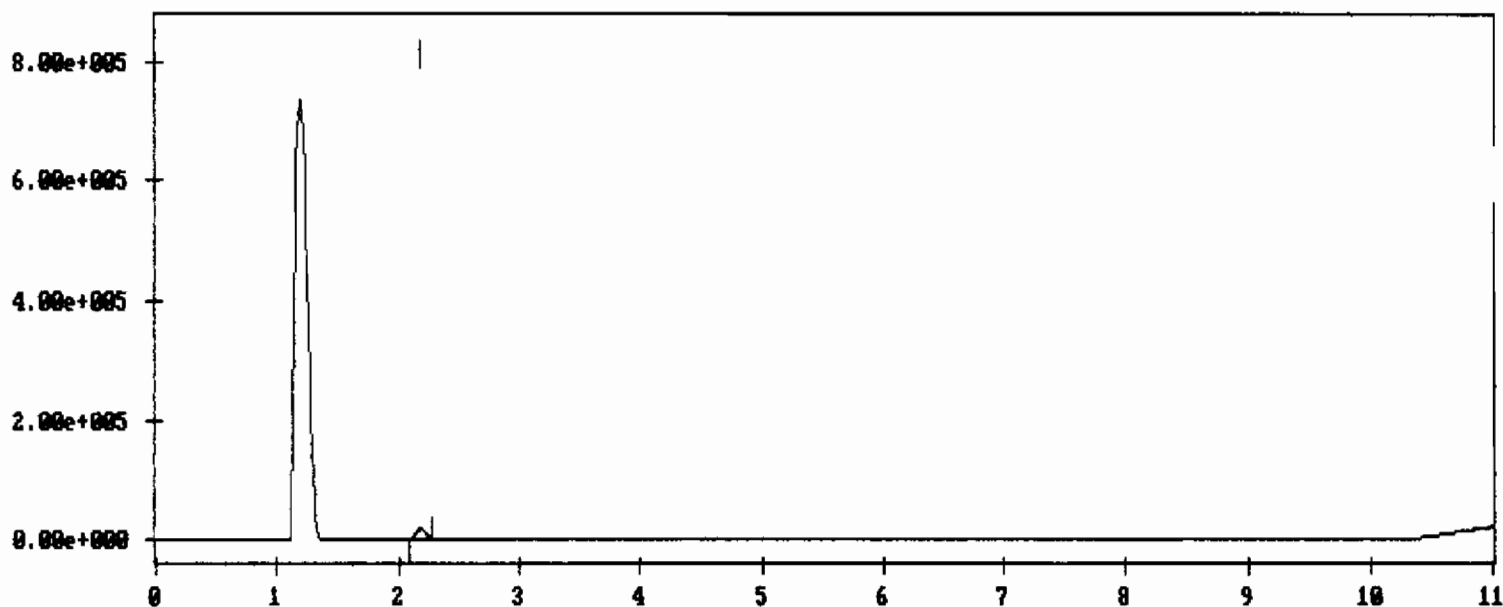
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/18/97 3:44p
 Detection results file created: 03/18/97 3:45p
 Final results file created: 03/18/97 3:45p

Name: Charleston Naval Base
 ment:

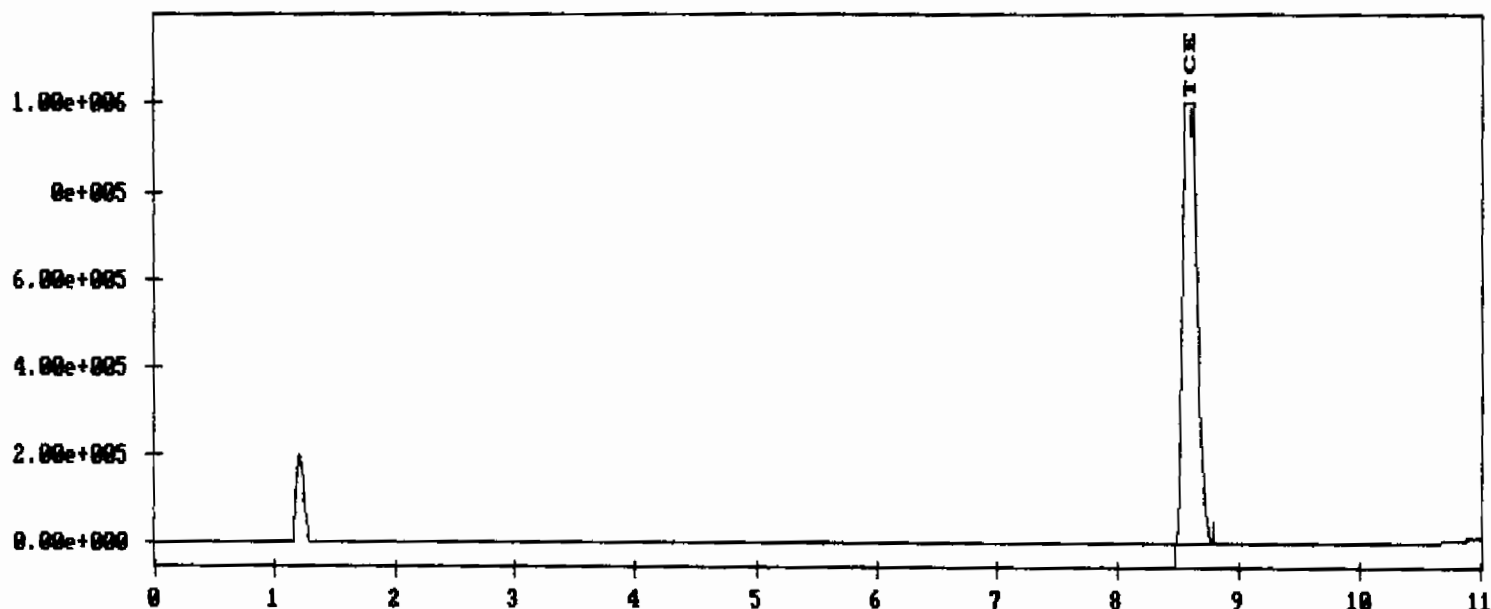
Acquisition method: C-VOL-MX

Sample name : 166GP04626
 Vial ID : 02
 Injection volume : 100.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 5.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.600	TCE	166.777466	8545307.00	999968.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		166.777466	8545307.00	999968.000

Raw data file created: 03/18/97 4:16p

Detection results file created: 03/18/97 4:16p

Final results file created: 03/18/97 4:16p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04636-A

Vial ID : 03

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

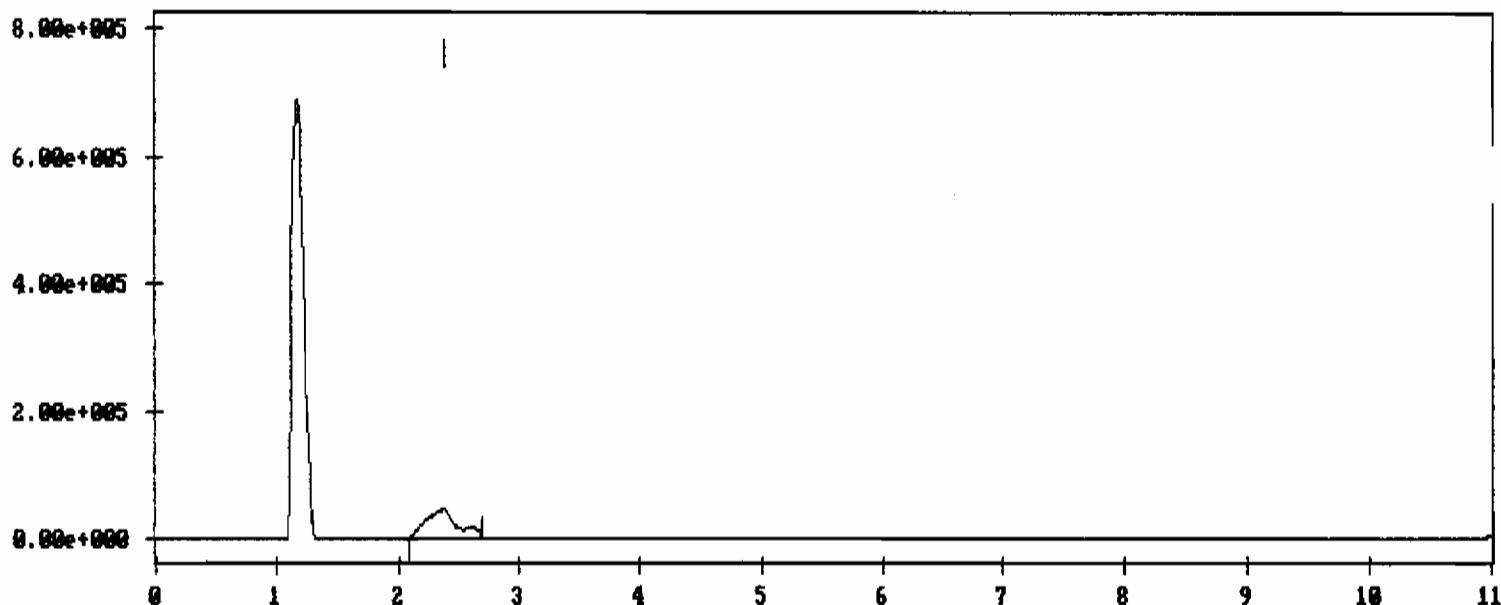
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/18/97 4:31p
 Detection results file created: 03/18/97 4:32p
 Final results file created: 03/18/97 4:32p

Name: Charleston Naval Base
 ment:

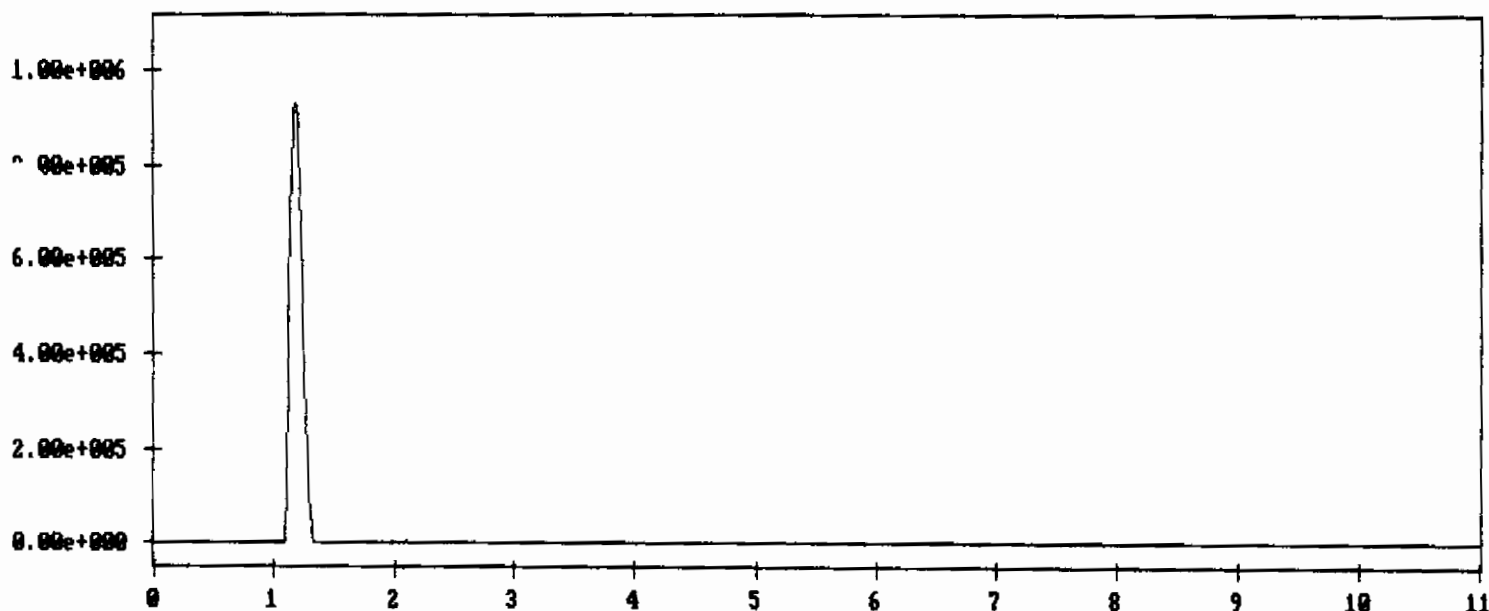
Acquisition method: C-VOL-MX

Sample name : 166GP04510
 Vial ID : 001
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/18/97 4:47p

Detection results file created: 03/18/97 4:47p

Final results file created: 03/18/97 4:47p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04526

Vial ID : 02

Injection volume : 100.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 5.000000

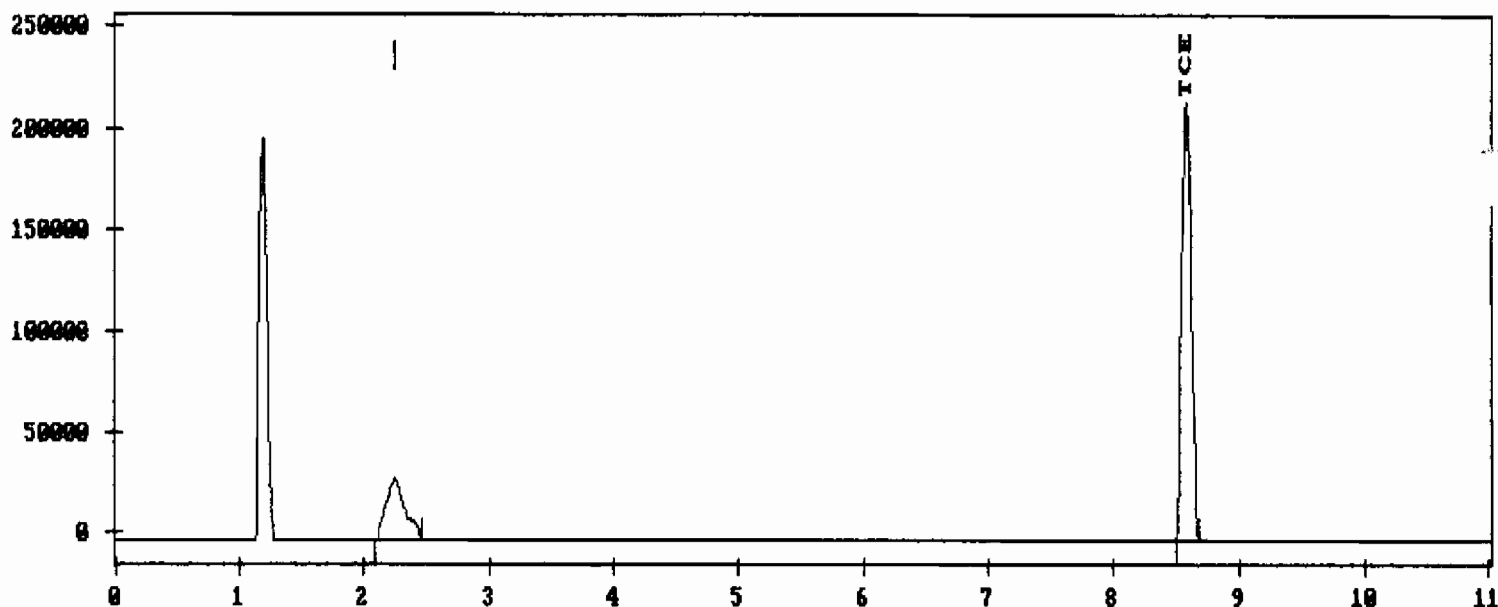
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.577	TCE	22.266977	1140910.50	216339.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		22.266977	1140910.50	216339.000

Raw data file created: 03/18/97 5:02p
 Detection results file created: 03/18/97 5:03p
 Final results file created: 03/18/97 5:03p

Name: Charleston Naval Base
 ment:

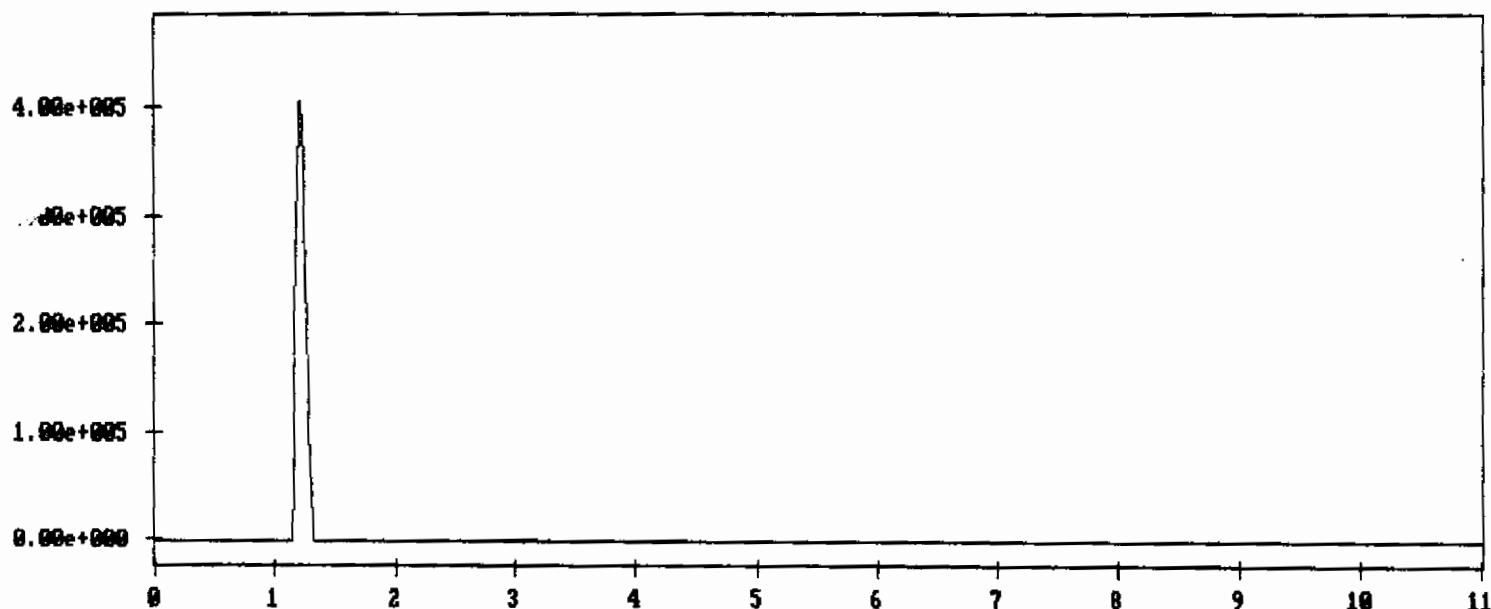
Acquisition method: C-VOL-MX

Sample name : 166GP04535
 Vial ID : 03
 Injection volume : 250.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 2.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 8:30a

Detection results file created: 03/19/97 8:30a

Final results file created: 03/19/97 8:30a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP05210

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

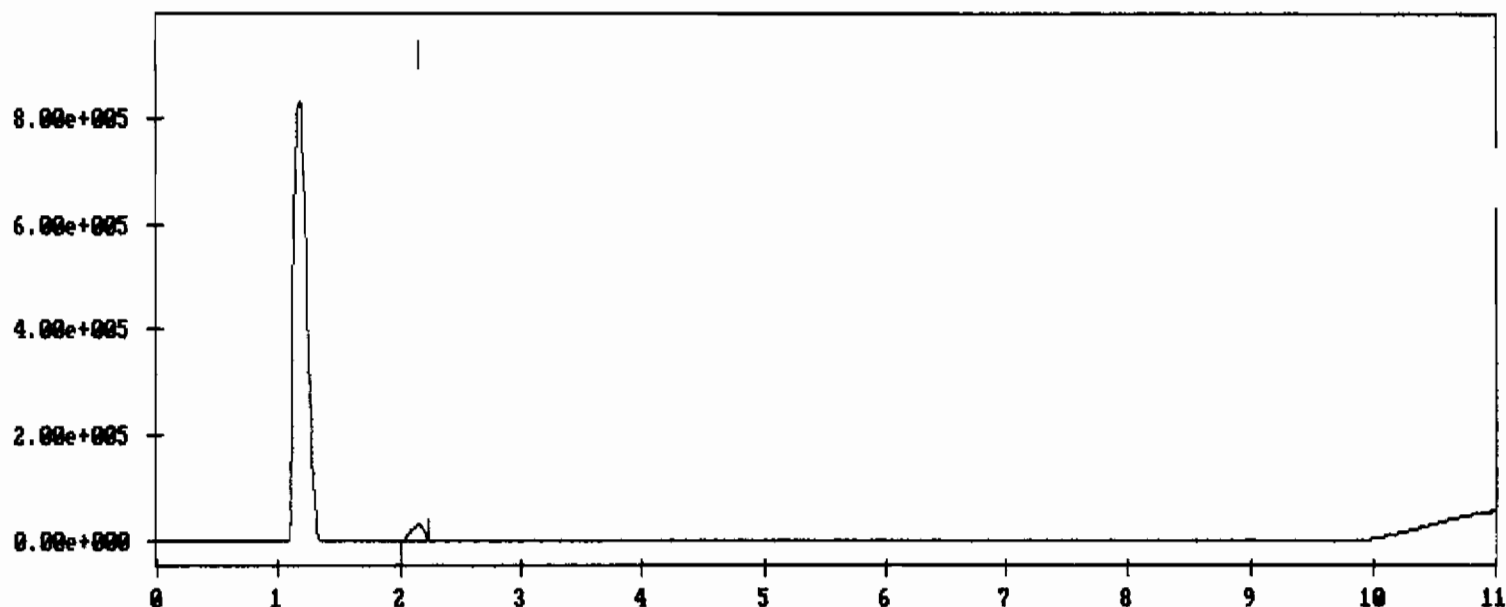
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 8:45a
 Detection results file created: 03/19/97 8:45a
 Final results file created: 03/19/97 8:45a

Name: Charleston Naval Base
 ment:

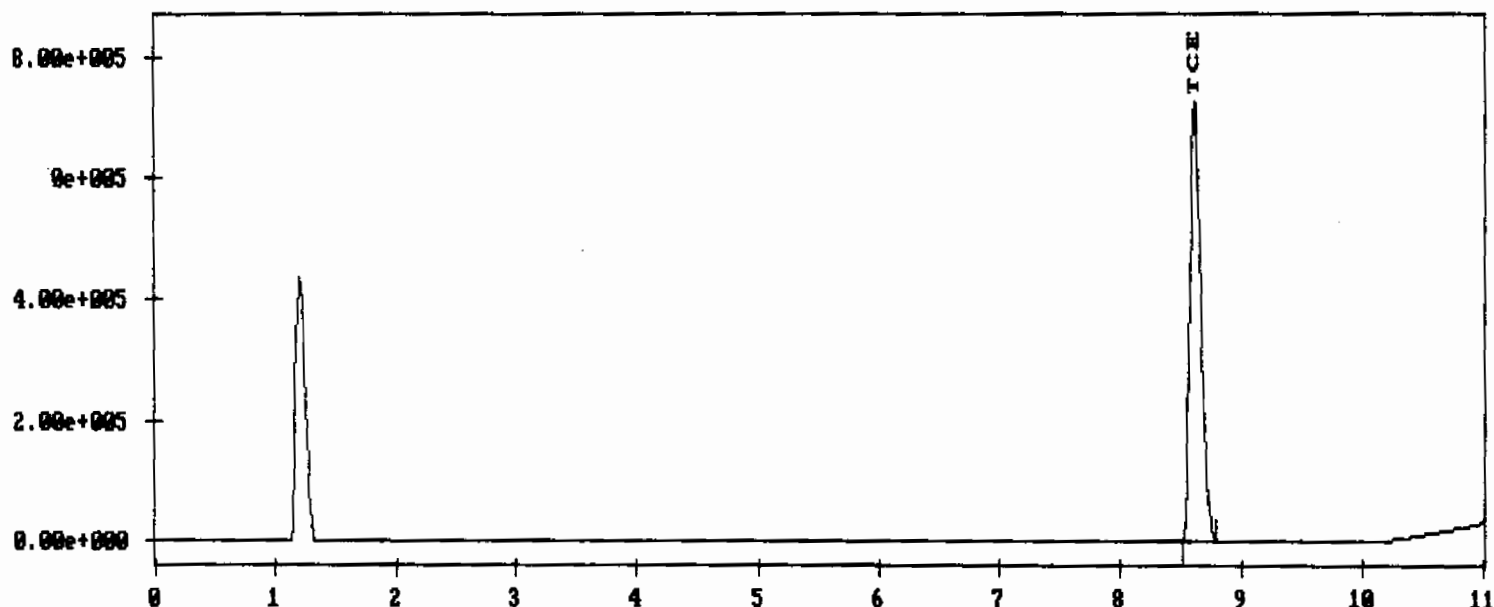
Acquisition method: C-VOL-MX

Sample name : 166GP05226
 Vial ID : 02
 Injection volume : 250.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 2.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.611	TCE	35.892944	4597687.00	726169.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		35.892944	4597687.00	726169.000

Raw data file created: 03/19/97 9:19a

Detection results file created: 03/19/97 9:20a

Final results file created: 03/19/97 9:20a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP05236

Vial ID : 03

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

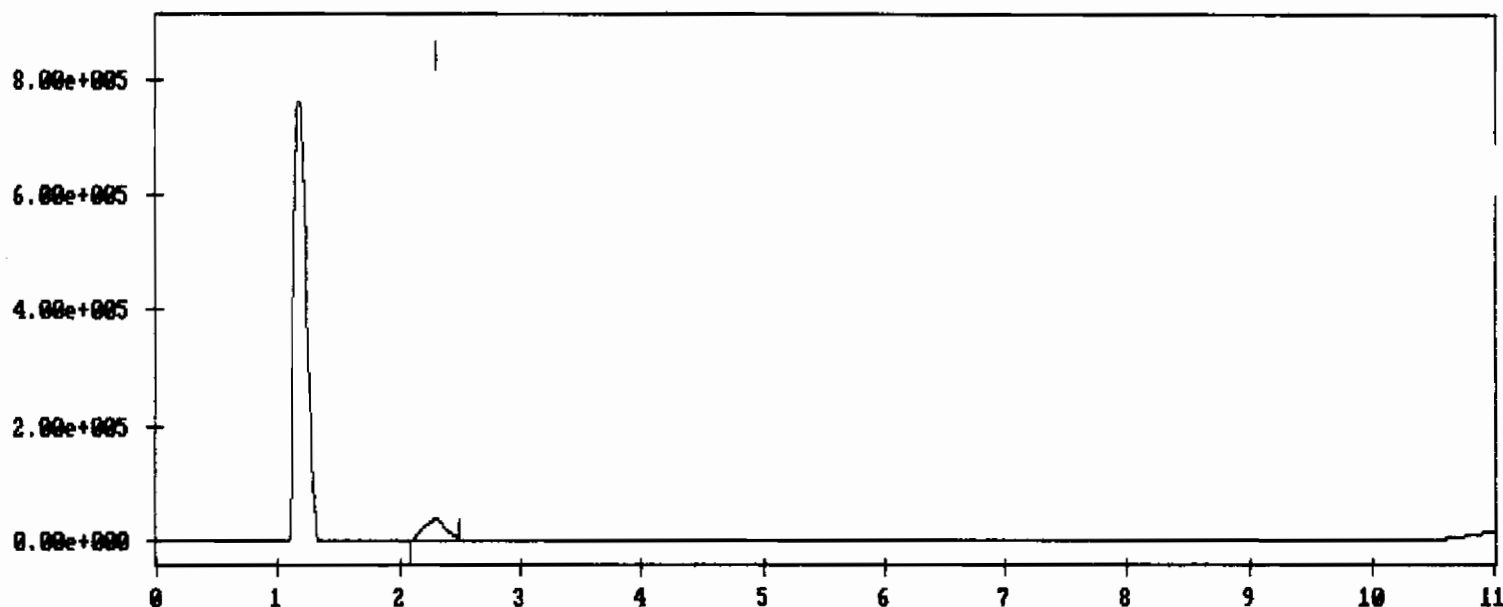
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 9:38a
 Detection results file created: 03/19/97 9:39a
 Final results file created: 03/19/97 9:39a

Name: Charleston Naval Base
 (ment:

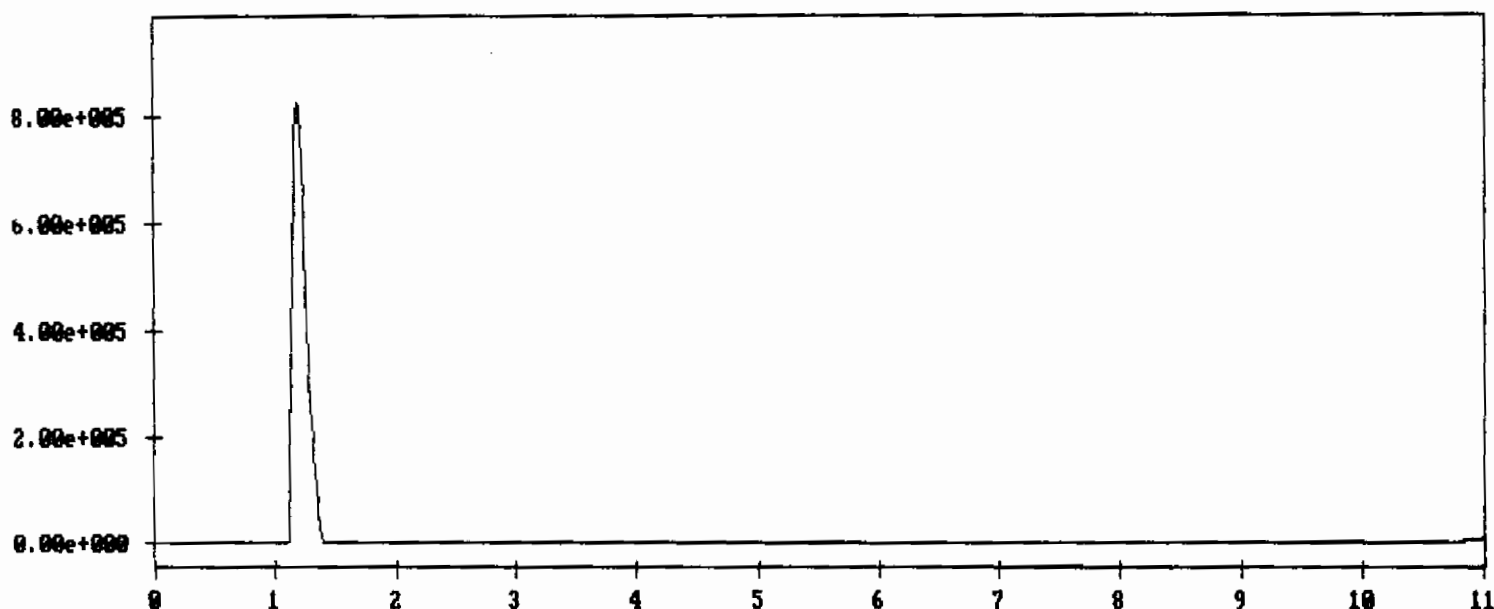
Acquisition method: C-VOL-MX

Sample name : 166GP04811
 Vial ID : 01
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 10:15a

Detection results file created: 03/19/97 10:17a

Final results file created: 03/19/97 10:17a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04824

Vial ID : 02

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

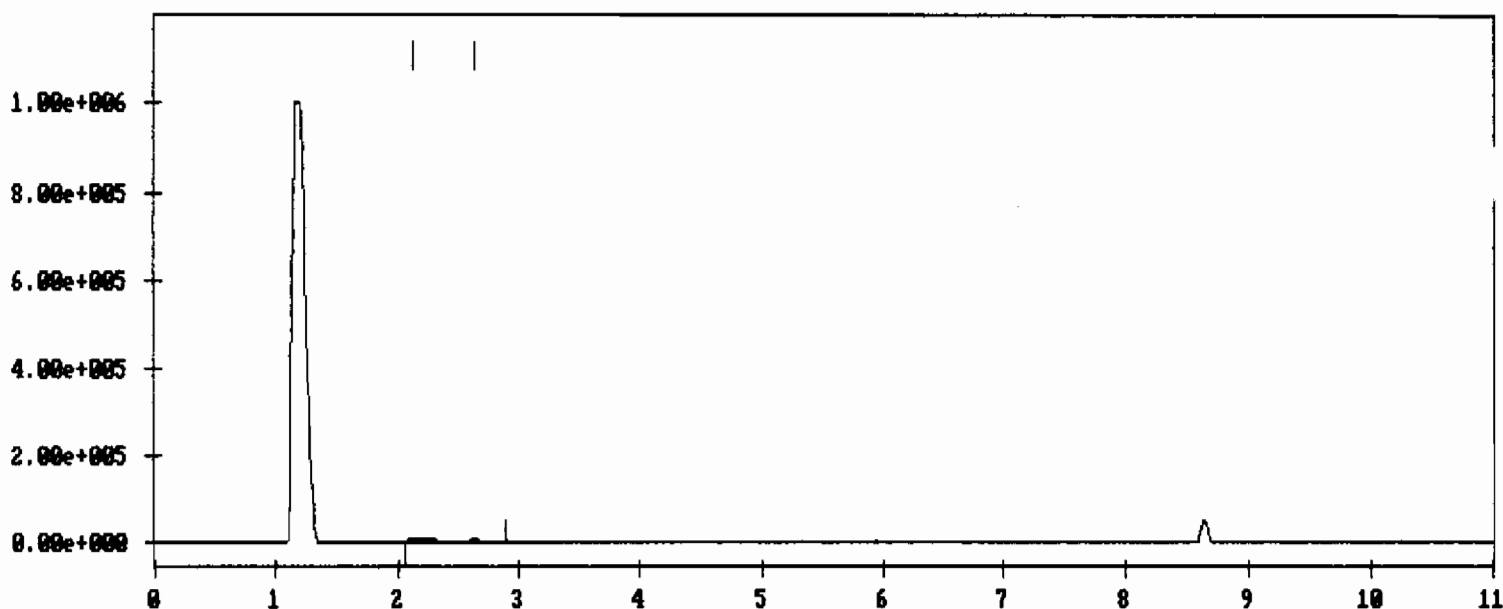
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 1:08p
 Detection results file created: 03/19/97 1:08p
 Final results file created: 03/19/97 1:08p

Name: Charleston Naval Base
 (ment:

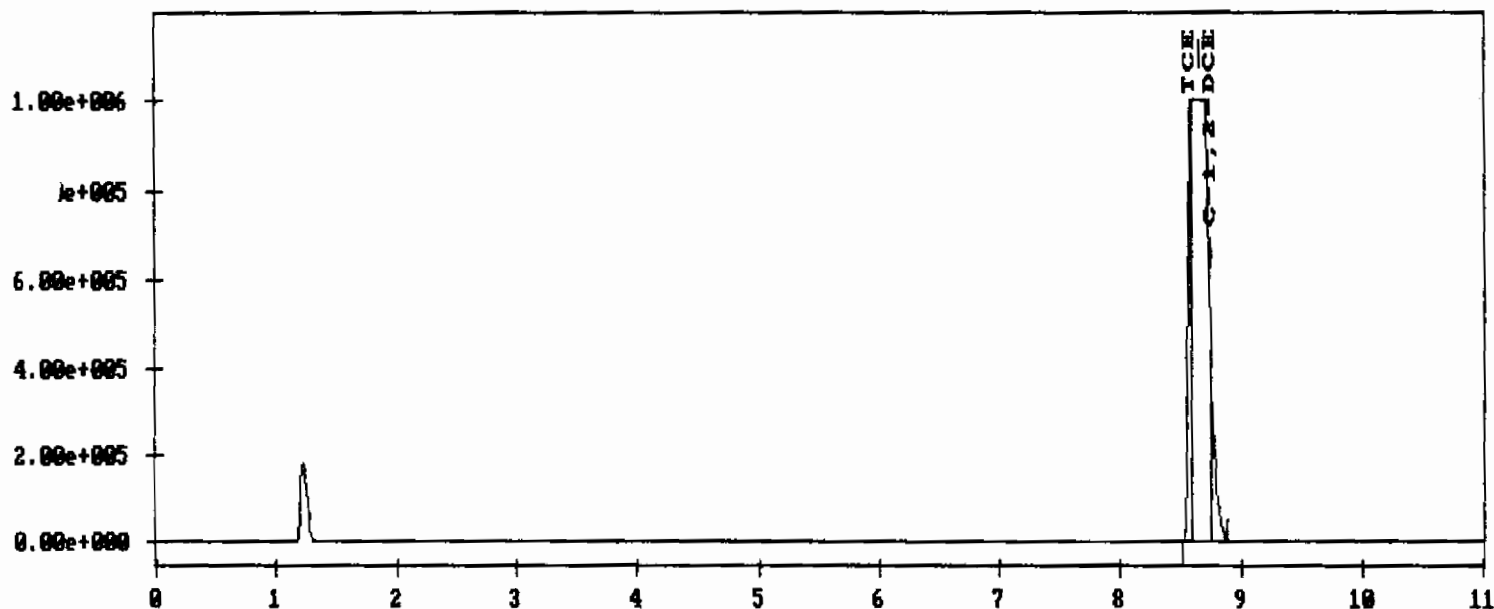
Acquisition method: C-VOL-MX

Sample name : 166GP04834-B
 Vial ID : 03-A
 Injection volume : 100.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 10.00000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.575	TCE	74.835587	1917204.75	999968.000
8.750	C-1,2-DCE	703.716187	643353.500	999968.000
		778.551758	2560558.25	1999936.00

Raw data file created: 03/19/97 11:08a

Detection results file created: 03/19/97 11:08a

Final results file created: 03/19/97 11:08a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04211

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

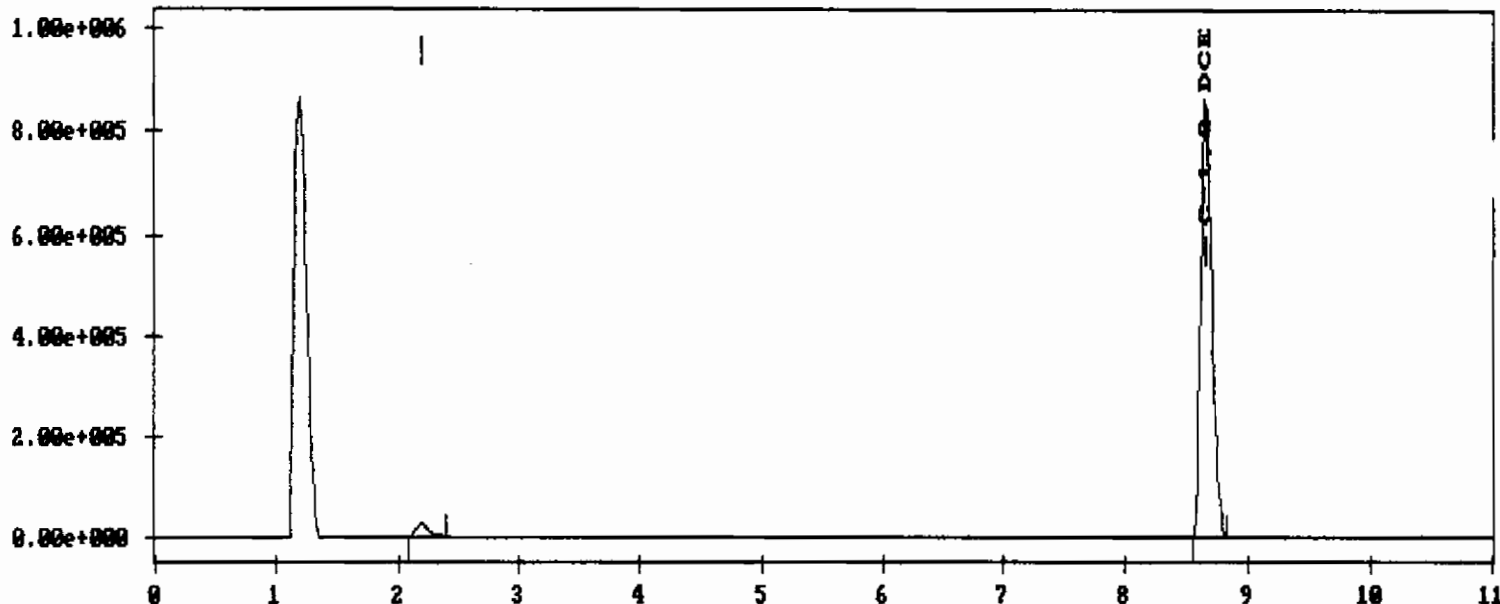
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
8.651	C-1,2-DCE	598.266907	5469493.50	852695.000
		598.266907	5469493.50	852695.000

Raw data file created: 03/19/97 11:38a
 Detection results file created: 03/19/97 12:05p
 Final results file created: 03/19/97 12:05p

Name: Charleston Naval Base
 ment:

Acquisition method: C-VOL-MX

Sample name : 166GP04224
 Vial ID : 02
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

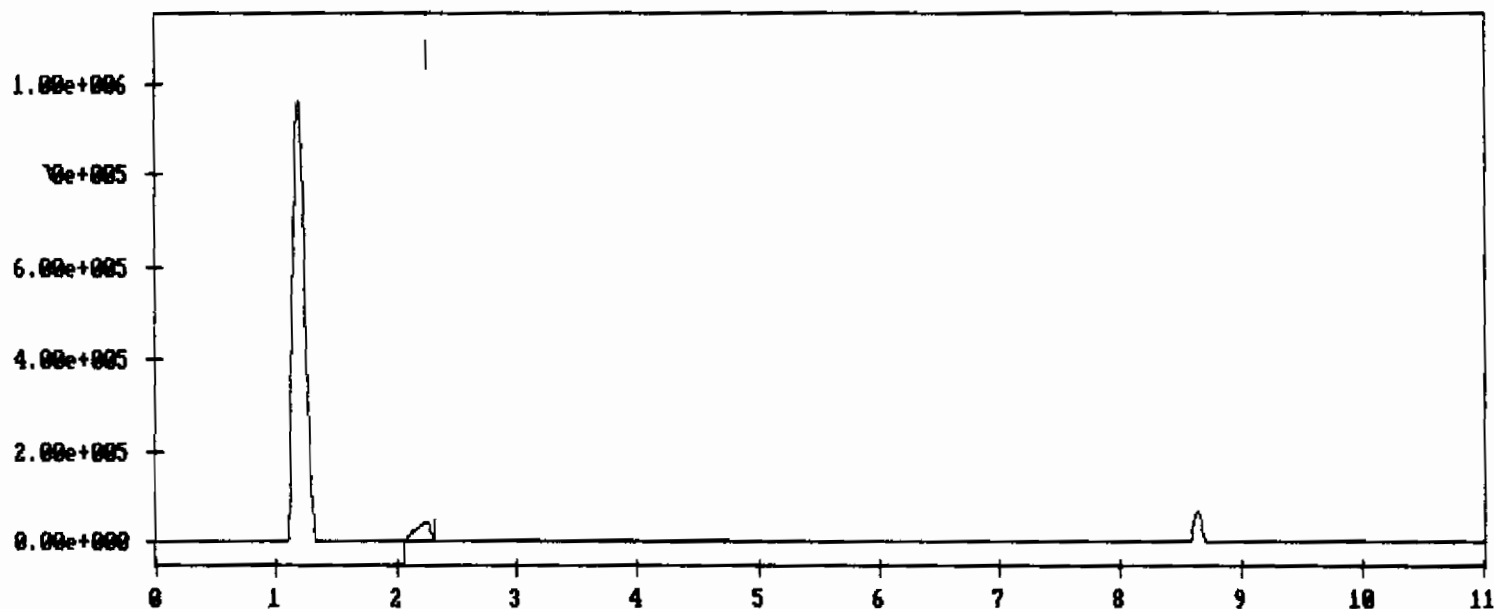
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 12:50p

Detection results file created: 03/19/97 12:50p

Final results file created: 03/19/97 12:50p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP04234-B

Vial ID : 03

Injection volume : 50.00000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 10.00000

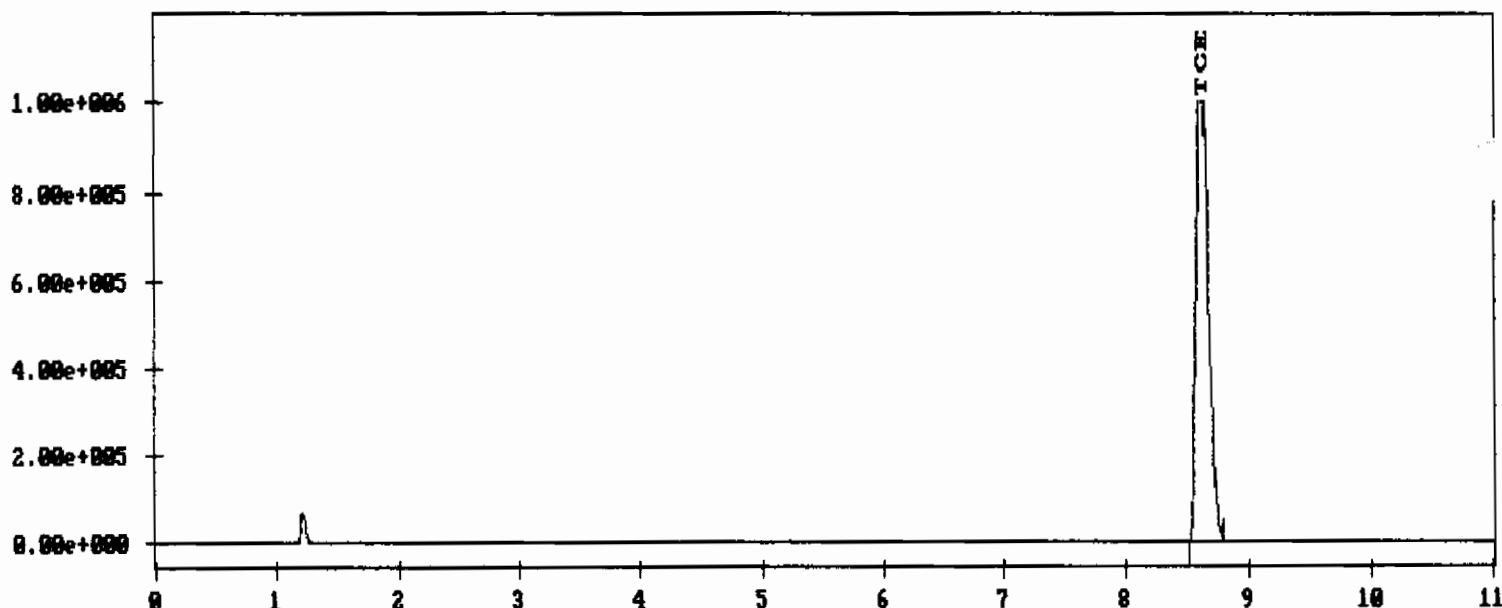
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.630	TCE	288.038605	7379229.50	999968.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		288.038605	7379229.50	999968.000

Raw data file created: 03/19/97 1:39p
 Detection results file created: 03/19/97 1:39p
 Final results file created: 03/19/97 1:39p

Name: Charleston Naval Base
 ment:

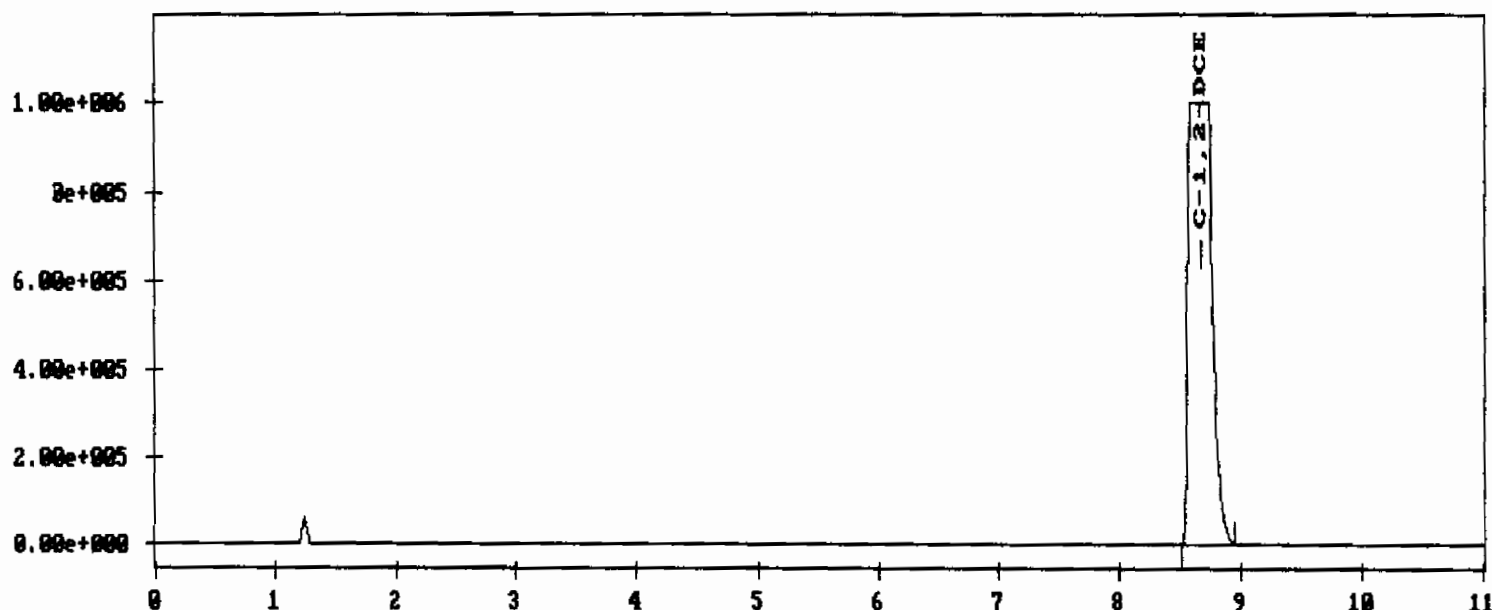
Acquisition method: C-VOL-MX

Sample name : 166GP03911
 Vial ID : 01
 Injection volume : 50.00000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 10.00000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
8.660	C-1,2-DCE	14957.23828	13674251.0	999968.000
		14957.23828	13674251.0	999968.000

Raw data file created: 03/19/97 2:09p

Detection results file created: 03/19/97 2:10p

Final results file created: 03/19/97 2:10p

Name: Charleston Naval Base
Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP03924
Vial ID : 02
Injection volume : 500.0000
IS amount (Sample): 0.000000
Sample amount : 1.000000
Dilution factor : 1.000000

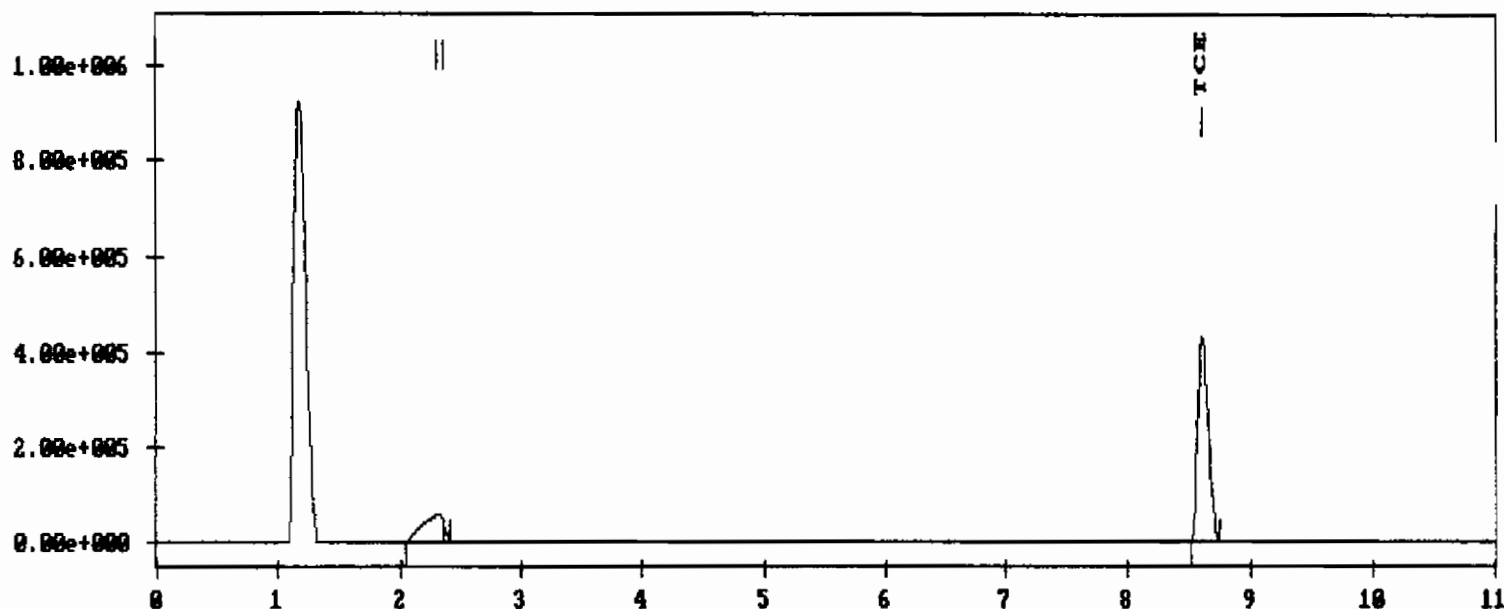
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.604	TCE	10.226010	2619790.50	434058.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		10.226010	2619790.50	434058.000

Raw data file created: 03/19/97 2:25p
 Detection results file created: 03/19/97 2:25p
 Final results file created: 03/19/97 2:25p

Name: Charleston Naval Base
 (ment:

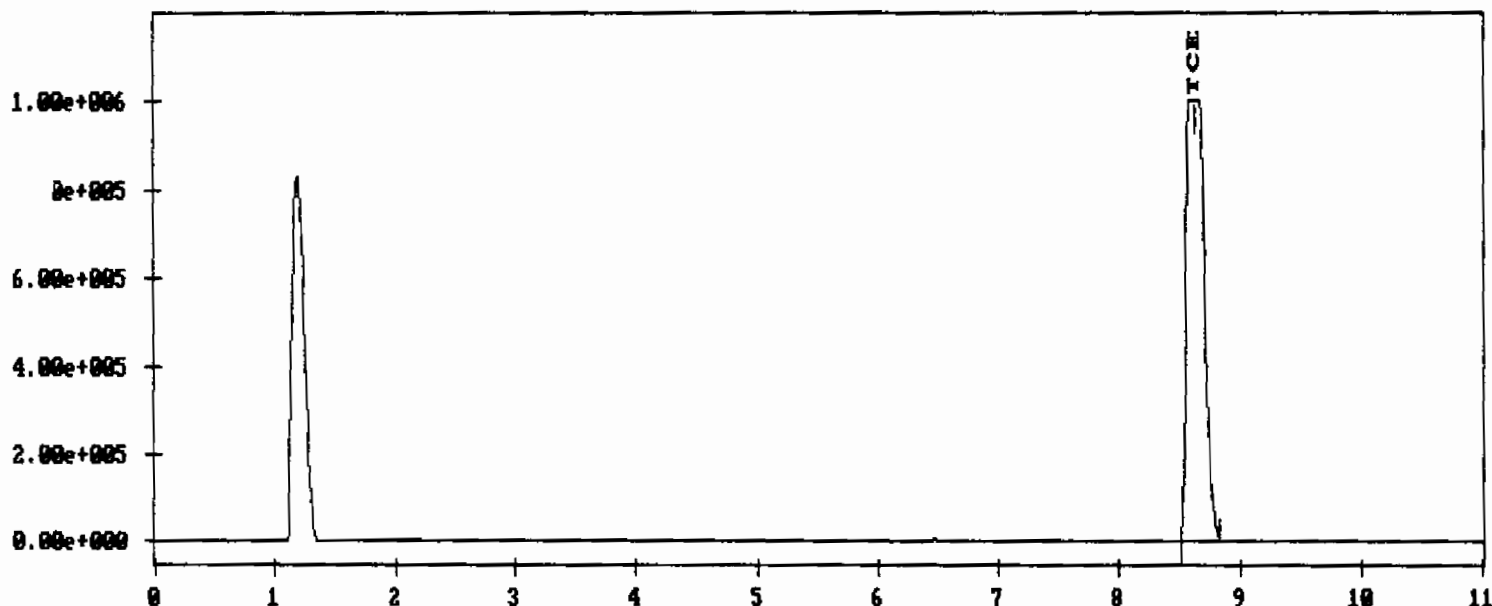
Acquisition method: C-VOL-MX

Sample name : 166GP03934
 Vial ID : 03
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.630	TCE	40.325893	10331047.0	999968.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		40.325893	10331047.0	999968.000

Raw data file created: 03/19/97 2:54p

Detection results file created: 03/19/97 2:55p

Final results file created: 03/19/97 2:55p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP03811

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

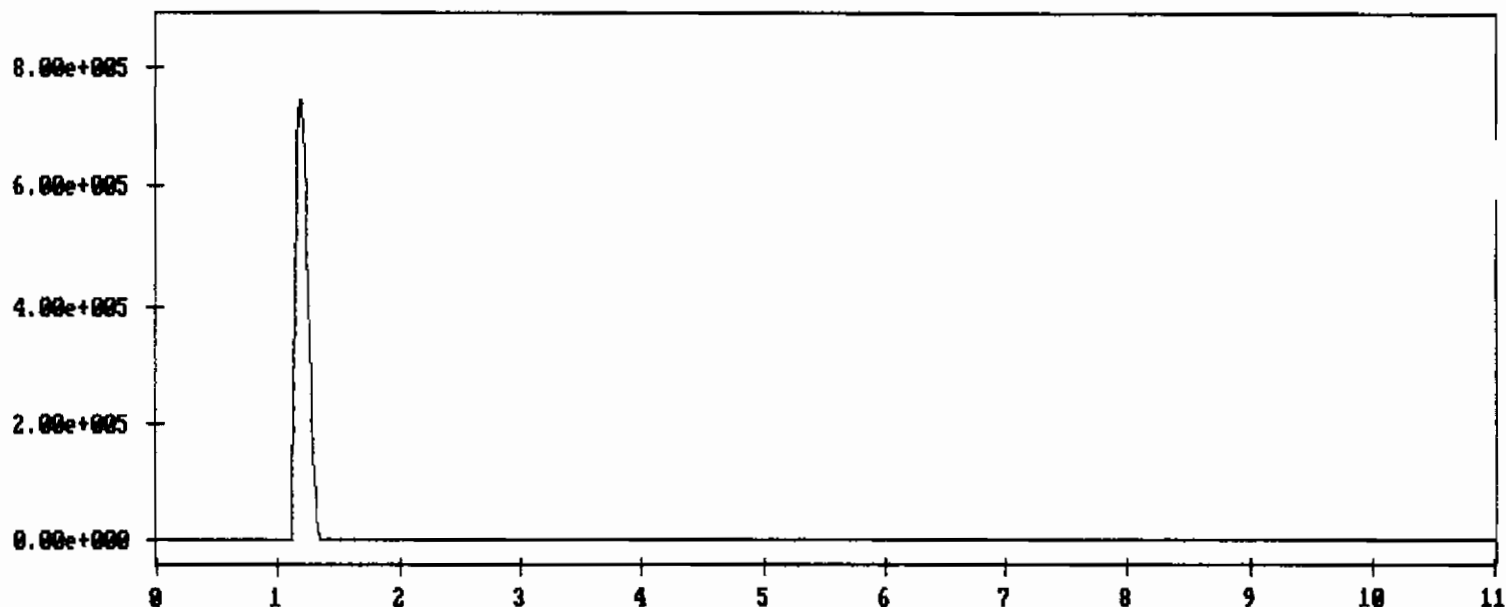
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 3:10p
 Detection results file created: 03/19/97 3:10p
 Final results file created: 03/19/97 3:10p

Name: Charleston Naval Base
 (ment:

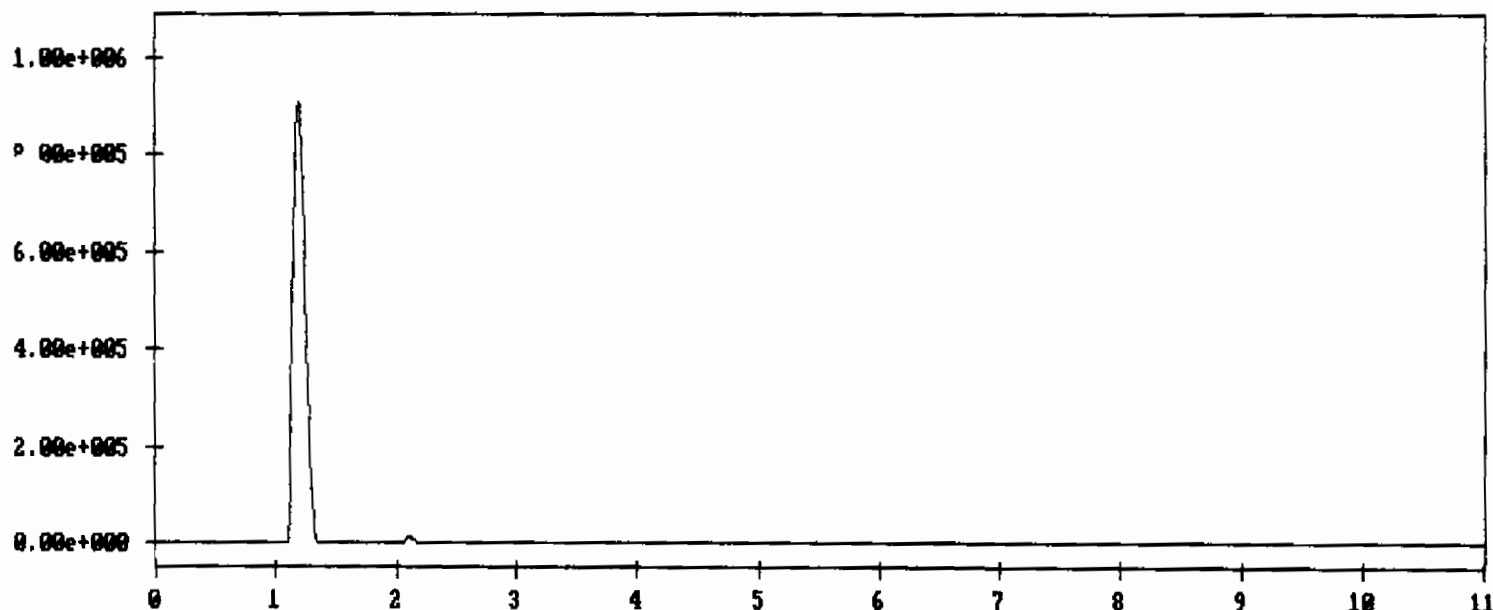
Acquisition method: C-VOL-MX

Sample name : 166GP03824
 Vial ID : 02
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 3:25p

Detection results file created: 03/19/97 3:27p

Final results file created: 03/19/97 3:27p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP03836

Vial ID : 03

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

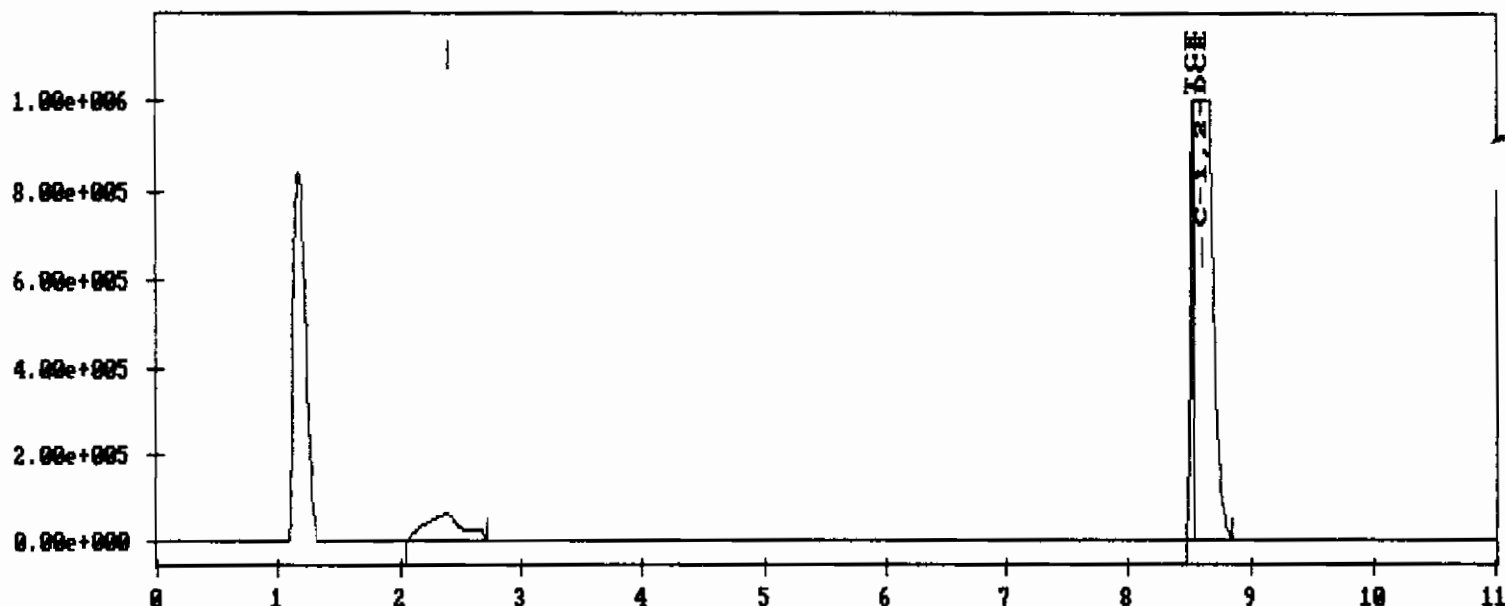
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.525	TCE	8.255610	2114995.50	999968.000
8.600	C-1,2-DCE	1116.327637	10205723.0	999968.000
		1124.583252	12320718.0	1999936.00

Add to following

Raw data file created: 03/19/97 3:43p
 Detection results file created: 03/19/97 3:44p
 Final results file created: 03/19/97 3:44p

Name: Charleston Naval Base
 (ment:

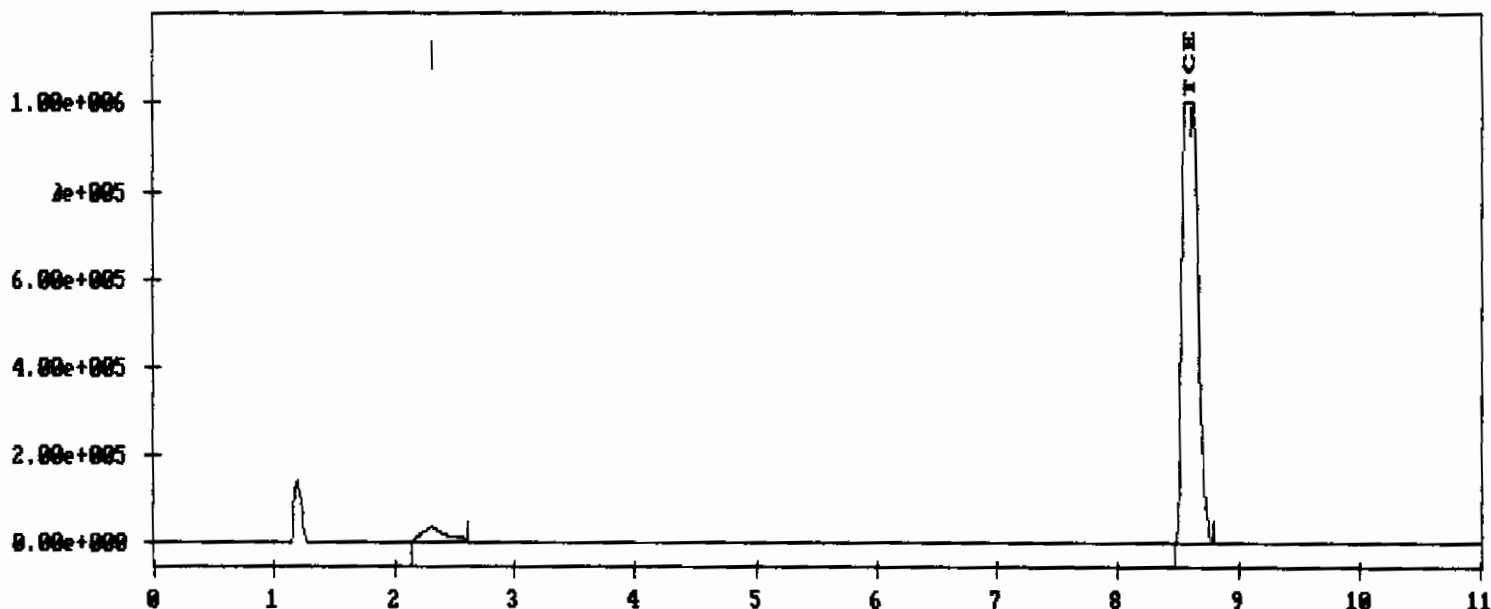
Acquisition method: C-VOL-MX

Sample name : 166GP03836-A
 Vial ID : 03
 Injection volume : 100.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 5.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.600	TCE	180.080963	9226949.00	999968.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
<hr/>				
		180.080963	9226949.00	999968.000

Total 1296

Raw data file created: 03/19/97 4:23p

Detection results file created: 03/19/97 4:23p

Final results file created: 03/19/97 4:23p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP03711-A

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

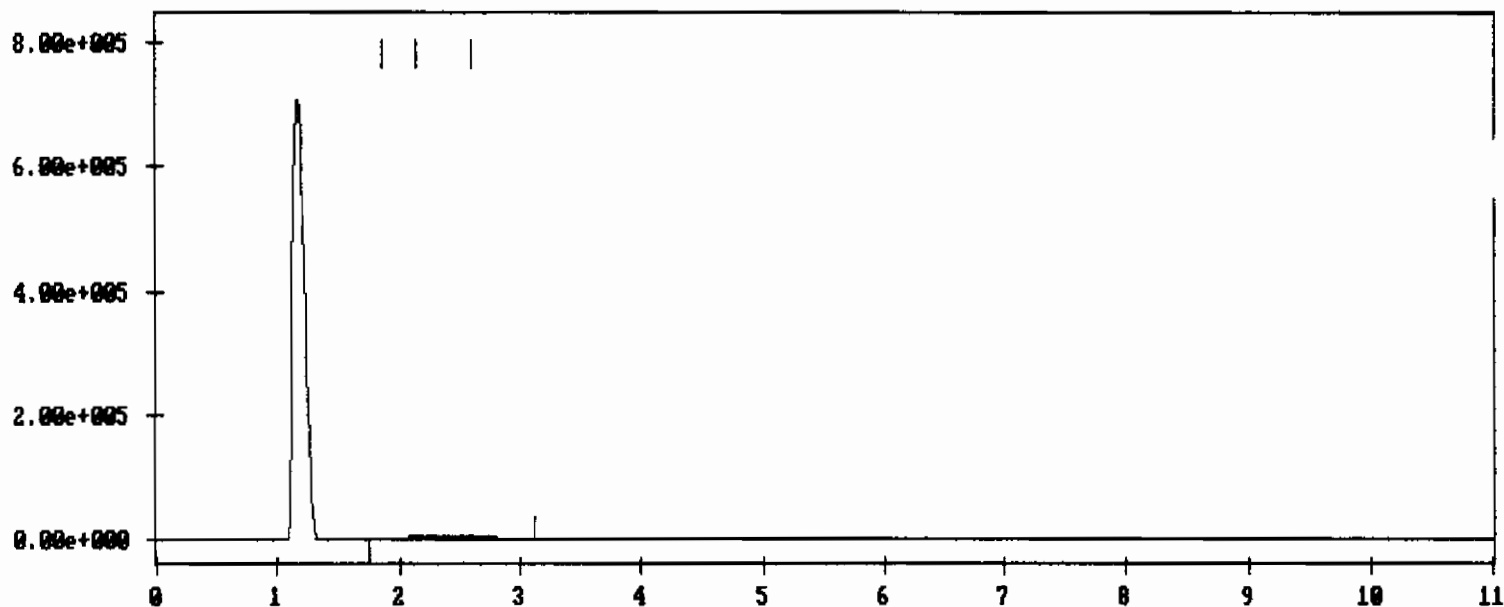
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 03/19/97 4:53p
 Detection results file created: 03/19/97 4:56p
 Final results file created: 03/19/97 4:56p

Name: Charleston Naval Base
 (ent):

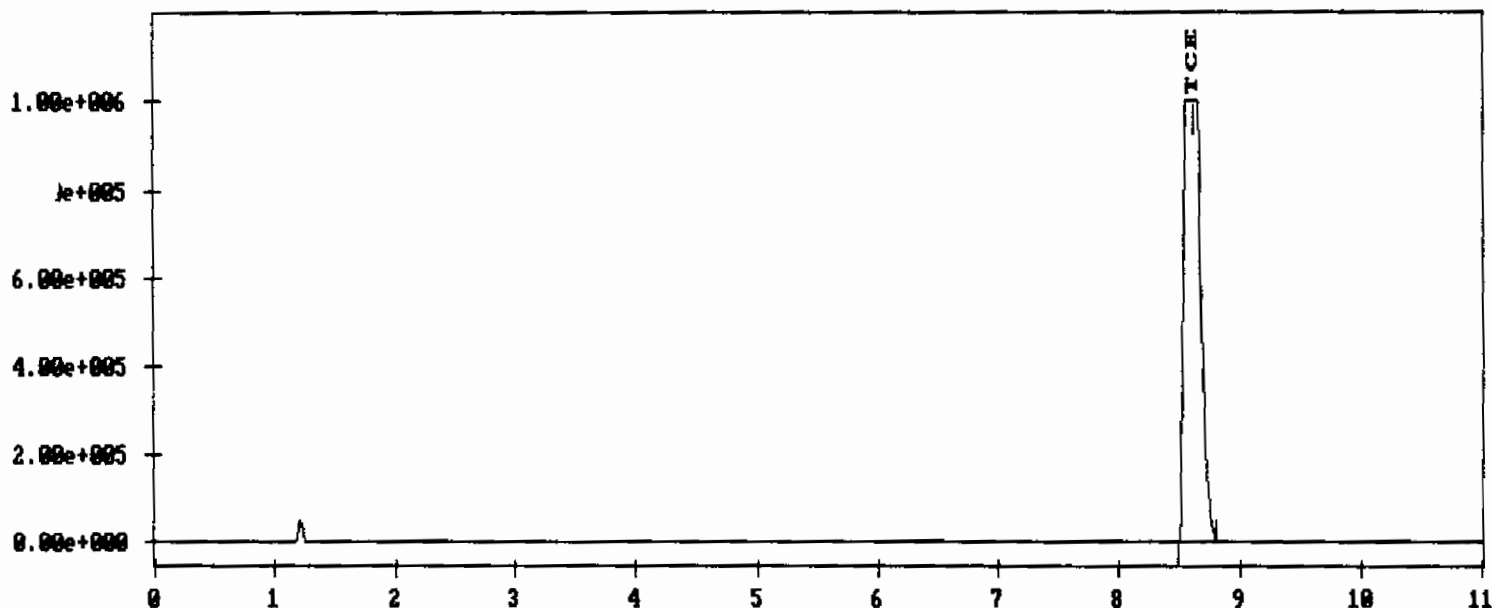
Acquisition method: C-VOL-MX

Sample name : 166GP03724-A
 Vial ID : 02
 Injection volume : 50.00000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 10.00000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p
 Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.610	TCE	390.537140	10005128.0	999968.000
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		390.537140	10005128.0	999968.000

Raw data file created: 03/19/97 5:12p

Detection results file created: 03/19/97 5:12p

Final results file created: 03/19/97 5:12p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : 166GP03735

Vial ID : 03

Injection volume : 50.00000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 10.00000

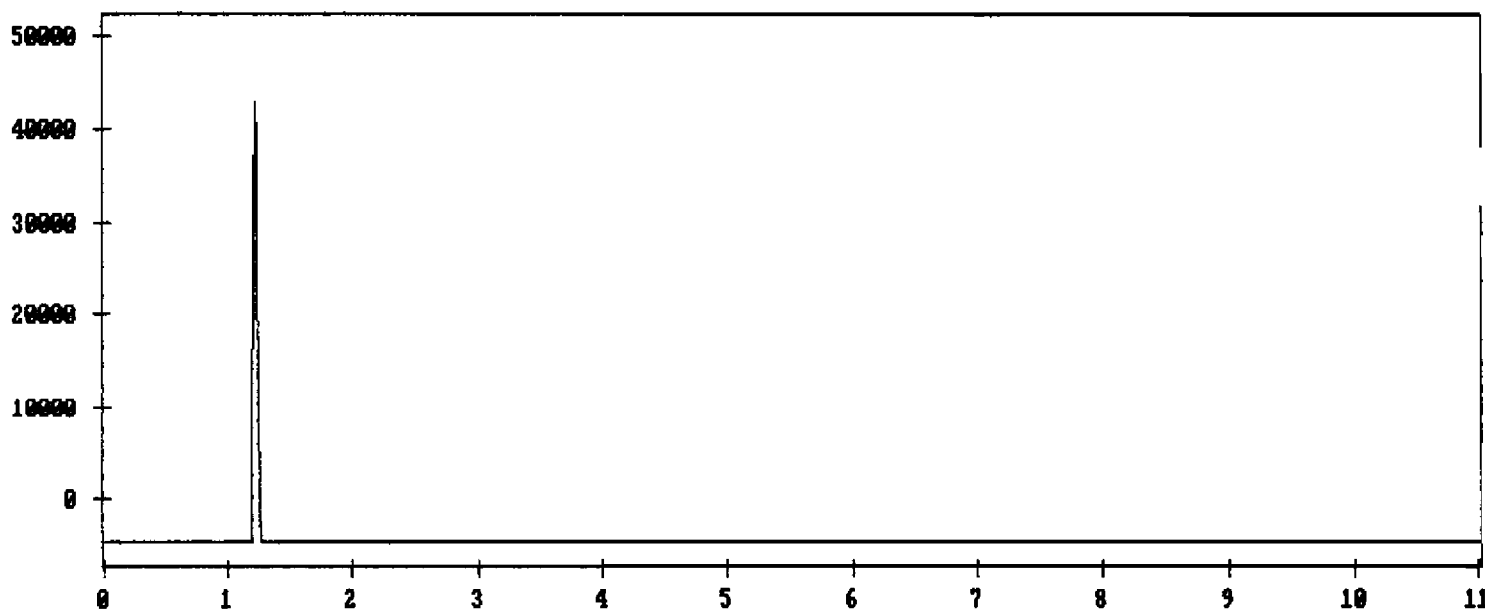
Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/16/97 4:59p

Reporting section : created 03/16/97 3:28p, modified 03/16/97 4:20p

Superior peak labels: Component Name



FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000



**WATER SAMPLING ANALYTICAL RESULTS
GAS CHROMATOGRAPH**

**CHARLESTON NAVAL BASE
PROJECT NO. 7124.02
ZONE K**

Prepared For:

**Ensafe/Allen & Hoshall
5909 Shelby Oaks Drive, Suite 201
Memphis, TN 38134**

APRIL 1997

Prepared By:

**Alpha Environmental Sciences, Inc.
Wappoo Executive Park
105 Wappoo Creek Drive, Suite 4-A
Charleston, SC 29412**

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CHARLESTON, SC 29412 · 803-795-1220 · FAX 795-1296



April 10, 1997

Mr. Britton Dotson
EnSafe/Allen & Hoshall
5909 Shelby Oaks Drive, Suite 201
Memphis, TN 38134

**RE: Water Sampling Analytical Results - March 31-April 4, 1997
Charleston Naval Base - Project No. 7124.02**

Mr. Dotson:

Alpha Environmental Sciences, Inc. has compiled the analytical results of the soil sampling conducted at the above referenced site. The results of our investigation are contained in the final report which follows.

I am available to answer any questions at your convenience. Thank you for this opportunity to be of service.

Sincerely,

Alpha Environmental Sciences, Inc.

A handwritten signature in black ink, appearing to read "Terry L. LaDuke".

Terry L. LaDuke, VP

TLL/sm

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CHARLESTON, SC 29412 · 803-795-1220 · FAX 795-1206

Charleston Naval Base
March 31-April 4, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
NBCK166GPO6411	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6424	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6434	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6514	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6524	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6534	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6614	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 31-April 4, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
NBCK166GPO6626	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	1343
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	681
NBCK166GPO6634	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	2492
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6714	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6726	Trans-1,2-Dichloroethylene	242
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6734	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	294
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	954
NBCK166GPO6814	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6826	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	2.4
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	375

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 31-April 4, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
NBCK166GPO6834	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6911	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6924	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO6932	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	5.0
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7111	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7124	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7134	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 31-April 4, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
NBCK166GPO7211	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7224	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7234	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7311	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7324	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7334	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7411	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL

Trans-1,2-Dichloroethylene	BDL - < 5.0 ppb
Trichloroethylene	BDL - < 5.0 ppb
Cis-1,2-Dichloroethylene	BDL - < 5.0 ppb
Vinyl Chloride	BDL - < 150 ppb

Charleston Naval Base
March 31-April 4, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Results (ppb)</u>
NBCK166GPO7424	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL
NBCK166GPO7434	Trans-1,2-Dichloroethylene	BDL
	Trichloroethylene	BDL
	Cis-1,2-Dichloroethylene	BDL
	Vinyl Chloride	BDL



GROUNDWATER SAMPLING ANALYTICAL RESULTS

CHARLESTON NAVAL BASE ZONE K

Prepared For:

**Ensafe/Allen & Hoshall
5909 Shelby Oaks Drive
Suite 201
Memphis, TN 38134**

Prepared By:

**Alpha Environmental Sciences, Inc.
105 Wappoo Creek Drive, Suite 4A
Charleston, SC 29412**

August 22, 1997

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CHARLESTON, SC 29412 · 803-795-1220 · FAX 795-1296



August 22, 1997

Mr. Britton Dotson
Ensafe/Allen & Hoshall
5909 Shelby Oaks Drive
Suite 201
Memphis, TN 38134

**RE: Ground Water Sampling and On-Site Analyses
Charleston Naval Base - Zone K - AES #7124.02-P2**

Mr. Dotson:

Alpha Environmental has compiled the analytical results of the on-site groundwater analyses conducted at Zone K, Charleston Naval Base. Attached, please find a summary of the results and analytical data sheets.

I appreciate the opportunity to be of service. If you should have any questions, please give me a call.

Sincerely,

Alpha Environmental Sciences, Inc.

A handwritten signature in cursive script that reads "Terry L. LaDuke".

Terry L. LaDuke
Vice President

TLL/ng

cc: Sam Weatherford

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Service Office:

WAPPOO EXEC. PARK, 105 WAPPOO CREEK DR., SUITE 4-A
CHARLESTON, SC 29412 • 803-795-1220 • FAX 795-1296



Mr. Britton Dotson
Ensafe
311 Plus Park Blvd. Suite 130
Nashville, TN 37217

RE: Analysis of Tetrachlorethylene-Charleston Navel Base-Zone K
Contract Number - N62467-89-D-0318

Dear Mr. Dotson:

Alpha Environmental Sciences Inc., has attempted to reread the chromatograms of the groundwater samples collected from Zone K on August 18-21, 1997, for tetrachloroethylene. However, upon running a standard for tetrachloroethylene, we are unable to compare the chromatograms since tetrachloroethylene elution time is approximately 12.5 minutes and our program was run for 11.0 minutes for each field sample. Our program was set up for a total run time on the GC of 11.0 minutes which is enough time to observe chromatogram peaks for cis & trans 1, 2-Dichloroethylene and Trichloroethylene. Based on injection of a standard for Tetrachloroethylene and the elution of this compound at 12.5 minutes, we are unable to comment whether Tetrachloroethylene was present in any of the groundwater samples.

We still have the samples which were collected in the field, however, the lids have been perforated for the field analysis and the containers have been at room temperature or higher since we completed the project. We would not recommend rerunning the samples given that the volatiles have likely evaporated.

We apologize for the confusion concerning this matter. It was our understanding just prior to mobilizing that the analyses would be the same as previously performed minus vinyl chloride. We would be happy to discuss this with you further. Please do not hesitate to contact us.

Respectfully Submitted,
Alpha Environmental Sciences Inc.

A handwritten signature in cursive script, reading "Terry LaDuke".

Terry LaDuke
Vice President/Senior Chemist

A handwritten signature in cursive script, reading "Roger D. Moore".

Roger D. Moore, P.G.
Professional Geologist/Division Manager

**GROUNDWATER ANALYTICAL RESULTS
CHARLESTON NAVAL BASE
ZONE K**

August 18-22, 1997

<u>Sample No.</u>	<u>Component</u>	<u>Result (ppb)</u>
NBCK166GPO8112	Trans-1,2-DCE	BDL
	TCE	334.87
	Cis-1,2-DCE	BDL
NBCK166GPO8120	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8135	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8212	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8222	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8235	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8312	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL

Trans-1,2-DCE = Trans-1,2-Dichloroethylene BDL - <5.0 PPB
TCE = Trichloroethylene BDL - <5.0 ppb
Cis-1,2-DCE = Cis-1,2-Dichloroethylene BDL - <5.0 ppb

<u>Sample No.</u>	<u>Component</u>	<u>Result (ppb)</u>
NBCK166GPO8322	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8335	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8412	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8422-A	Trans-1,2-DCE	BDL
	TCE	16.13
	Cis-1,2-DCE	BDL
NBCK166GPO8435	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8512	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8522-A	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8535	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8612	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL

Trans-1,2-DCE = Trans-1,2-Dichloroethylene BDL - <5.0 PPB
 TCE = Trichloroethylene BDL - <5.0 ppb
 Cis-1,2-DCE = Cis-1,2-Dichloroethylene BDL - <5.0 ppb

<u>Sample No.</u>	<u>Component</u>	<u>Result (ppb)</u>
NBCK166GPO8622	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8632	Trans-1,2-DCE	BDL
	TCE	226.54
	Cis-1,2-DCE	BDL
NBCK166GPO8712	Trans-1,2-DCE	BDL
	TCE	BDL(Trace)
	Cis-1,2-DCE	BDL
NBCK166GPO8722	Trans-1,2-DCE	BDL
	TCE	131.40
	Cis-1,2-DCE	BDL
NBCK166GPO8735	Trans-1,2-DCE	BDL
	TCE	16.18
	Cis-1,2-DCE	BDL
NBCK166GPO8812	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8822	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO8835	Trans-1,2-DCE	BDL
	TCE	58.04
	Cis-1,2-DCE	BDL
NBCK166GPO8912	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL

Trans-1,2-DCE = Trans-1,2-Dichloroethylene BDL - <5.0 PPB
 TCE = Trichloroethylene BDL - <5.0 ppb
 Cis-1,2-DCE = Cis-1,2-Dichloroethylene BDL - <5.0 ppb

<u>Sample No.</u>	<u>Component</u>	<u>Result (ppb)</u>
NBCK166GPO8922	Trans-1,2-DCE	BDL
	TCE	150.27
	Cis-1,2-DCE	BDL
NBCK166GPO8935	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9012	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9022	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9035	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9112	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9122	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9135	Trans-1,2-DCE	BDL
	TCE	33.25
	Cis-1,2-DCE	BDL
NBCK166GPO9212	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL

Trans-1,2-DCE = Trans-1,2-Dichloroethylene BDL - <5.0 PPB
 TCE = Trichloroethylene BDL - <5.0 ppb
 Cis-1,2-DCE = Cis-1,2-Dichloroethylene BDL - <5.0 ppb

<u>Sample No.</u>	<u>Component</u>	<u>Result (ppb)</u>
NBCK166GPO9222	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9232	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9312	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL
NBCK166GPO9322	Trans-1,2-DCE	BDL
	TCE	46.89
	Cis-1,2-DCE	BDL
NBCK166GPO9335	Trans-1,2-DCE	BDL
	TCE	BDL
	Cis-1,2-DCE	BDL

Trans-1,2-DCE = Trans-1,2-Dichloroethylene BDL - <5.0 PPB
 TCE = Trichloroethylene BDL - <5.0 ppb
 Cis-1,2-DCE = Cis-1,2-Dichloroethylene BDL - <5.0 ppb

ANALYTICAL DATA SHEETS

Raw data file created: 08/19/97 11:22a
 Detection results file created: 08/26/97 6:55p
 Final results file created: 08/26/97 6:55p

Name: Charleston Naval Base
 ment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8112
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX
 Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 08/26/97 6:55p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 11:05a

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.071	V_CL	0.000000	1154826.37	39989.8515
6.612	T-1,2-DCE	1.015886	38408.9882	6021.89843
9.025	TCE	334.870026	3061458.75	387797.718
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		335.885925	4254694.00	433809.468

Raw data file created: 08/19/97 11:42a

Detection results file created: 08/19/97 11:42a

Final results file created: 08/19/97 11:42a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8120

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 11:05a

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.057	V_CL	0.000000	732645.937	37496.3476
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	732645.937	37496.3476

Raw data file created: 08/19/97 1:27p
 Detection results file created: 08/19/97 1:28p
 Final results file created: 08/19/97 1:28p

Name: Charleston Naval Base
 Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8135
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX
 Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 11:05a

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/19/97 2:03p

Detection results file created: 08/19/97 2:04p

Final results file created: 08/19/97 2:04p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8212

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 11:05a

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/19/97 2:23p
 Detection results file created: 08/19/97 2:25p
 Final results file created: 08/19/97 2:25p

Name: Charleston Naval Base
 (ment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8222
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 11:05a

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.376	V_CL	0.000000	1397005.50	43491.8710
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	1397005.50	43491.8710

Raw data file created: 08/19/97 3:01p

Detection results file created: 08/19/97 3:02p

Final results file created: 08/19/97 3:02p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8235

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.320	V_CL	0.000000	1687641.12	39559.5585
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	1687641.12	39559.5585

Raw data file created: 08/19/97 3:52p
 Detection results file created: 08/19/97 3:53p
 Final results file created: 08/19/97 3:53p

Name: Charleston Naval Base
 (ment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8312
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.217	V_CL	0.000000	53317.6875	5052.45605
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	53317.6875	5052.45605

Raw data file created: 08/19/97 4:06p

Detection results file created: 08/19/97 4:07p

Final results file created: 08/19/97 4:07p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8322

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.083	V_CL	0.000000	717965.500	32088.7363
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	717965.500	32088.7363

Raw data file created: 08/19/97 4:41p
 Detection results file created: 08/19/97 4:41p
 Final results file created: 08/19/97 4:41p

Name: Charleston Naval Base
 ment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8335
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.233	V_CL	0.000000	673924.437	24246.5273
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	673924.437	24246.5273

Raw data file created: 08/20/97 7:09a

Detection results file created: 08/20/97 7:10a

Final results file created: 08/20/97 7:10a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8412

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.385	V_CL	0.000000	1083103.50	43984.2695
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	1083103.50	43984.2695

Raw data file created: 08/20/97 7:39a

Detection results file created: 08/26/97 6:58p

Final results file created: 08/26/97 6:58p

Name: Charleston Naval Base

Content:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8422-A

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 6:58p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.133	V_CL	0.000000	464501.625	28587.9140
6.818	T-1,2-DCE	0.392073	14823.6337	601.209473
NF	C-1,2-DCE	Not Found	Not Found	Not Found
9.171	TCE	16.129225	147457.078	34432.8632
		16.521297	626782.312	63621.9843

Raw data file created: 08/20/97 7:56a

Detection results file created: 08/20/97 7:57a

Final results file created: 08/20/97 7:57a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8435

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.355	V_CL	0.000000	3422734.00	72894.7890
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	3422734.00	72894.7890

Raw data file created: 08/20/97 8:57a

Detection results file created: 08/20/97 8:58a

Final results file created: 08/20/97 8:58a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8512

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.213	V_CL	0.000000	791953.500	39618.6484
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	791953.500	39618.6484

Raw data file created: 08/20/97 9:34a

Detection results file created: 08/20/97 9:34a

Final results file created: 08/20/97 9:34a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8522-A

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/20/97 9:50a

Detection results file created: 08/20/97 10:55a

Final results file created: 08/20/97 10:55a

Name: Charleston Naval Base

(ment:

Acquisition method: C-VOL-MX

Sample name : NBCK\166GPO8535

Vial ID : 01

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.097	V_CL	0.000000	1381689.12	56611.2343
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	1381689.12	56611.2343

Raw data file created: 08/20/97 11:48a

Detection results file created: 08/20/97 11:51a

Final results file created: 08/20/97 11:51a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8612

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.022	V_CL	0.000000	409297.593	44807.9296
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	409297.593	44807.9296

Raw data file created: 08/20/97 12:06p

Detection results file created: 08/20/97 12:07p

Final results file created: 08/20/97 12:07p

Name: Charleston Naval Base

(ent:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8622

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
6.933	T-1,2-DCE	1.451441	54876.5937	363.892639
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		1.451441	54876.5937	363.892639

Raw data file created: 08/20/97 12:35p

Detection results file created: 08/26/97 6:52p

Final results file created: 08/26/97 6:52p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8632

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 6:52p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.071	V_CL	0.000000	1450901.12	52986.2304
6.789	T-1,2-DCE	1.393640	52691.2578	2957.85864
9.134	TCE	226.541992	2071098.87	289210.437
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		227.935638	3574691.25	345154.531

Raw data file created: 08/20/97 1:32p
 Detection results file created: 08/26/97 7:00p
 Final results file created: 08/26/97 7:00p

Name: Charleston Naval Base
 (ment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8712
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:00p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.429	V_CL	0.000000	49862.1484	1077.31689
6.668	T-1,2-DCE	0.325050	12289.6240	492.696472
NF	C-1,2-DCE	Not Found	Not Found	Not Found
9.131	TCE	2.720096	24867.7382	7375.65527
		3.045146	87019.5156	8945.66894

Raw data file created: 08/20/97 1:51p

Detection results file created: 08/26/97 7:01p

Final results file created: 08/26/97 7:01p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8722

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:01p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.448	V_CL	0.000000	1856078.50	59909.2578
6.707	T-1,2-DCE	0.688373	26026.2675	684.349121
NF	C-1,2DCE	Not Found	Not Found	Not Found
9.097	TCE	131.400955	1201297.75	156835.234
		132.089325	3083402.50	217428.843

Raw data file created: 08/20/97 2:26p
 Detection results file created: 08/26/97 7:04p
 Final results file created: 08/26/97 7:04p

Name: Charleston Naval Base
 (ment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8735
 Vial ID : SAMP
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:04p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.396	V_CL	0.000000	2265806.75	56626.1757
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2DCE	Not Found	Not Found	Not Found
9.091	TCE	16.181921	147938.828	32580.9121
		16.181921	2413745.50	89207.0859

Raw data file created: 08/20/97 3:07p

Detection results file created: 08/20/97 3:07p

Final results file created: 08/20/97 3:07p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8812

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.040	V_CL	0.000000	1094622.62	55893.7617
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	1094622.62	55893.7617

Raw data file created: 08/20/97 3:32p

Detection results file created: 08/20/97 3:33p

Final results file created: 08/20/97 3:33p

Name: Charleston Naval Base

(Sent:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8822

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.117	V_CL	0.000000	1083653.12	50544.6875
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	1083653.12	50544.6875

Raw data file created: 08/20/97 3:50p

Detection results file created: 08/26/97 7:05p

Final results file created: 08/26/97 7:05p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK/166GPO8835

Vial ID : SAMP

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:05p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
2.458	V_CL	0.000000	2736810.50	76018.6640
6.510	T-1,2-DCE	0.928297	35097.4062	1199.27722
NF	C-1,2-DCE	Not Found	Not Found	Not Found
8.989	TCE	58.038242	530598.937	76709.2265
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		58.966541	3302507.00	153927.156

Raw data file created: 08/21/97 7:44a
 Detection results file created: 08/21/97 7:45a
 Final results file created: 08/21/97 7:45a

Name: Charleston Naval Base
 ment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO8912
 Vial ID : 8912
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p
 Calibration section: created 03/16/97 3:28p, modified 03/25/97 12:57p
 Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 8:16a

Detection results file created: 08/26/97 7:06p

Final results file created: 08/26/97 7:06p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO8922

Vial ID : 8912

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:06p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.234	c_1,2-DCE	0.042024	10766.2021	903.997131
9.723	TCE	150.268021	1373784.75	177350.578
-----	-----	-----	-----	-----
		150.310043	1384551.00	178254.578

Raw data file created: 08/21/97 8:31a

Detection results file created: 08/26/97 7:08p

Final results file created: 08/26/97 7:08p

Name: Charleston Naval Base

Content:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO8935

Vial ID : 8912

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:08p

Reporting section : created 03/16/97 3:28p, modified 08/19/97 2:41p

FULL REPORT

Ret Time (Min)	Component Name	Concentr. PPB	Area (uV*Sec)	Height (uV)
NF	V_CL	Not Found	Not Found	Not Found
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
9.722	TCE	1.594307	14575.5244	8786.28125
		1.594307	14575.5244	8786.28125

Raw data file created: 08/21/97 9:19a

Detection results file created: 08/21/97 9:20a

Final results file created: 08/21/97 9:20a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9012

Vial ID : 9012

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 9:06a

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 9:36a

Detection results file created: 08/21/97 9:38a

Final results file created: 08/21/97 9:38a

Name: Charleston Naval Base

(ent:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9022

Vial ID : 9022

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 9:06a

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 11:40a

Detection results file created: 08/21/97 11:41a

Final results file created: 08/21/97 11:41a

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9035

Vial ID : 9035

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 9:06a

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
6.115	T-1,2-DCE	0.477179	28287.2832	1495.72106
NF	C-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
		0.477179	28287.2832	1495.72106

Raw data file created: 08/21/97 11:55a
 Detection results file created: 08/21/97 11:58a
 Final results file created: 08/21/97 11:58a

Name: Charleston Naval Base
 (ment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9112
 Vial ID : 9112
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 9:06a

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 12:12p

Detection results file created: 08/21/97 12:14p

Final results file created: 08/21/97 12:14p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9122

Vial ID : 9122

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 12:14p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
8.259	TCE	0.225934	55989.7109	27266.5234
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.225934	55989.7109	27266.5234

Raw data file created: 08/21/97 12:39p

Detection results file created: 08/26/97 7:09p

Final results file created: 08/26/97 7:09p

Name: Charleston Naval Base

(ent:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9135

Vial ID : 9135

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:09p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
9.767	TCE	33.249714	431905.906	70776.4140
		33.249714	431905.906	70776.4140

Raw data file created: 08/21/97 1:36p

Detection results file created: 08/21/97 1:37p

Final results file created: 08/21/97 1:37p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9212

Vial ID : 9212

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 12:14p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 1:53p

Detection results file created: 08/21/97 1:58p

Final results file created: 08/21/97 1:58p

Name: Charleston Naval Base

(ment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9222

Vial ID : 9222

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 12:14p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 2:24p

Detection results file created: 08/21/97 2:24p

Final results file created: 08/21/97 2:24p

Name: Charleston Naval Base

Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9232

Vial ID : 9232

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 03/16/97 4:07p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 12:14p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 3:01p

Detection results file created: 08/21/97 3:04p

Final results file created: 08/21/97 3:04p

Name: Charleston Naval Base

(Sent:

Acquisition method: C-VOL-MX

Sample name : NBCK166GP09312

Vial ID : 9312

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 08/21/97 3:04p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 12:14p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Raw data file created: 08/21/97 3:18p
 Detection results file created: 08/26/97 7:10p
 Final results file created: 08/26/97 7:10p

Name: Charleston Naval Base
 Comment:

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9322
 Vial ID : 9322
 Injection volume : 500.0000
 IS amount (Sample): 0.000000
 Sample amount : 1.000000
 Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 08/21/97 3:21p
 Calibration section: created 03/16/97 3:28p, modified 08/26/97 7:10p
 Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
9.693	TCE	46.887001	609051.000	88478.8125
		46.887001	609051.000	88478.8125

Raw data file created: 08/21/97 3:49p

Detection results file created: 08/21/97 3:50p

Final results file created: 08/21/97 3:50p

Name: Charleston Naval Base

(ent):

Acquisition method: C-VOL-MX

Sample name : NBCK166GPO9335

Vial ID : 9335

Injection volume : 500.0000

IS amount (Sample): 0.000000

Sample amount : 1.000000

Dilution factor : 1.000000

Processing method: CLVOL-MX

Integration section: created 03/16/97 3:28p, modified 08/21/97 3:21p

Calibration section: created 03/16/97 3:28p, modified 08/21/97 12:14p

Reporting section : created 03/16/97 3:28p, modified 08/21/97 9:22a

FULL REPORT

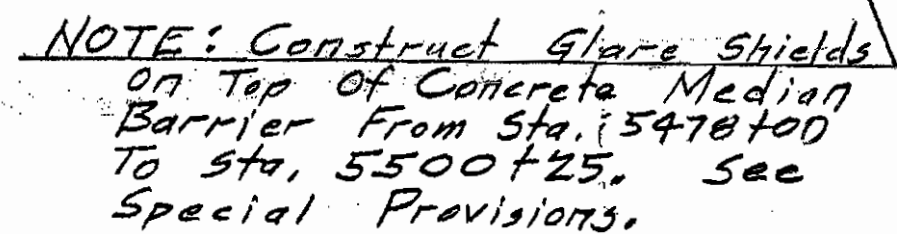
Ret Time (Min)	Component Name	Concentr.	Area (uV*Sec)	Height (uV)
NF	T-1,2-DCE	Not Found	Not Found	Not Found
NF	TCE	Not Found	Not Found	Not Found
NF	C-1,2-DCE	Not Found	Not Found	Not Found
		0.000000	0.000000	0.000000

Appendix G
Interstate 26 Stormwater Sewer System

FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	CHARLESTON	10.850	I-526 4(128)	I-26	76	283

MARK CLARK EXPRESSWAY
ROUTE I-26

MARK CLARK EXPRESSWAY
ROUTE I-26



Appendix H
SWMU 166
TCE Plume Investigation
Analytical Results for Dye Trace Samples

CRAWFORD AND ASSOCIATES, INCGroundwater Hydrologists, Geologists, Environmental Scientists
Laboratory Services

1136 US 31W BY-PASS

Bowling Green, KY 42101

(502) 745-9224

E-mail: canda@premieret.net

LABORATORY REPORT SHEET
FLUORIMETRIC ANALYSIS RESULTS

Charleston-K Naval Base

Analysis requested by:

Ensafe-Britton Dotson

D&C GREEN #8

ROSINE

RHODAMINE WT

SULPHORHODAMINE B

SOLOPHENOL 508

TROPICAL CBS-X

Color Index:

Color Index:

Color Index:

Color Index:

Color Index:

Fabric Brightening

Solvent Green 7

Acid Red 87

Acid Red 388

Acid Red 52

Direct Yellow 96

Agent 351

Dye Receptor:

Dye Receptor:

Dye Receptor:

Dye Receptor:

Dye Receptor:

Dye Receptor:

Grid Samples

Activated Charcoal

Activated Charcoal

Activated Charcoal

Unbleached Cotton

Unbleached Cotton

Analysis by:

Analysis by:

Analysis by:

Analysis by:

Analysis by:

Analysis by:

Spectrofluorophotometer

Spectrofluorophotometer

Spectrofluorophotometer

Spectrofluorophotometer

Ultraviolet Light

Ultraviolet Light

Code Number	Event	Date Collected	Feature Name	Comment	CHARCOAL AND WATER SAMPLES								COTTON SAMPLES	
					D&C GREEN #8		ROSINE		RHODAMINE WT		SULPHORHODAMINE B		SOLOPHENOL 508	TROPICAL CBS-X
					Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Results
1	01		QA-WATER		ND									
2	01		QA-D&C GREEN #8		+	0.092								
0101	01	9/25/97	0101		ND									
0103	01	9/25/97	0103		ND									
0105	01	9/25/97	0105		ND									
0106	01	9/25/97	0106			8780.700								
0107	01	9/25/97	0107			16187.500								
0108	01	9/25/97	0108			120.217								
0201	01	9/25/97	0201		ND									
0203	01	9/25/97	0203		ND									
0205	01	9/25/97	0205		ND									
0207	01	9/25/97	0207		ND									
0209	01	9/25/97	0209			20.901								
0210	01	9/25/97	0210			1381.300								
0211	01	9/25/97	0211			2800.200								
0212	01	9/25/97	0212			3821.400								
0213	01	9/25/97	0213			2221.200								
0214	01	9/25/97	0214			1382.000								
0215	01	9/25/97	0215			150.316								
0216	01	9/25/97	0216			100.068								
0403	01	9/25/97	0403		ND									
0405	01	9/25/97	0405		ND									
3	01		QA-WATER		ND									
4	01		QA-D&C GREEN #8		+	0.091								

ND Below Quantitation Limit

B Background

NS No Sample

+ Positive

++ Very Positive

+++ Extremely Positive

Created 10/9/97

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Code Number	Event	Date Collected	Feature Name	Comment	CHARCOAL AND WATER SAMPLES								COTTON SAMPLES	
					D&C GREEN #8		EOSINE		RHODAMINE WT		SULPHORHODAMINE B		SOLOPHENOL 500	TINOPAL CBS-X
					Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Results
0407	01	9/25/97	0407		ND									
0409		9/25/97	0409			65.784								
0411	01	9/25/97	0411			45.350								
0413	01	9/25/97	0413			35.093								
0414	01	9/25/97	0414			25.857								
0416	01	9/25/97	0416			16.052								
0418	01	9/25/97	0418			11.035								
0420	01	9/25/97	0420			2.863								
0422	01	9/25/97	0422			0.153								
0424	01	9/25/97	0424		ND									
0426	01	9/25/97	0426		ND									
6	01		QA-WATER		ND									
8	01		QA-D&C GREEN #8		+	0.090								

Analyzed by: Will Clouston on 10/2/97

Comments: _____

ND Below Quantitation Limit
 B B and
 NS No

+ Positive
 ++ V) Iive
 +++ Extr. Positive